

RAILWAY

September 1933

# TRACK *and* STRUCTURES

CONVENTION

NUMBER

This Issue . . .

Programs of

Conventions

Complete List of

Exhibits at Coliseum

Santa Fe Tie

Renewals Mechanized

Fire Protection at

Oil-Storage Tanks

& O. Repairs

Under Water

Contents -- Page 833

FORMERLY

Railway  
Engineering and  
Maintenance

*The Best*

**IN RAIL JOINTS...**

*Less* MAINTENANCE

*Longer* RAIL LIFE



• N.Y.C. PASSENGER TRAIN  
NEAR COLD SPRING, N.

THE RAIL JOINT COMPANY Inc

50 CHURCH ST.

NEW YORK, N.Y.

# Let Reliance **HY-CROME** spring washers



*help you reduce right-of-way maintenance costs*

Loose rail joint bolts are a costly never-ending maintenance operation. In back of every Reliance Hy-Crome Spring Washer there are over 35 years of continuing research and development by Eaton Reliance engineers and railroad maintenance-of-way engineers. Reliance Hy-Crome Spring Washers are manufactured specifically to combat rail joint bolt looseness.

Manufactured from special alloy spring steel under rigid metallurgical control in all phases of their production, the inherent reactive pressure and wide reactive range automatically compensate for bolt looseness as a result of bolt elongation, normal wear and vibration created by high speeds and heavy wheel loads.

Put Reliance Hy-Crome Spring Washers to work for you to keep rail joint bolts tighter longer. Write today for Engineering folder R 53.



**"Edgemark of Quality"**



Visit Our Booths Nos. 82 and 83

## RELIANCE DIVISION



MANUFACTURING COMPANY

PPF CO.



OFFICE and PLANTS 401 Charles Ave., SE, MASSILLON, OHIO

SALES OFFICES: New York • Cleveland • Detroit • Chicago • St. Louis •

Springlines and Saws Soap and Reaming Rings

Special Steels Spring Lock Washers Hoz-Fas-Ners

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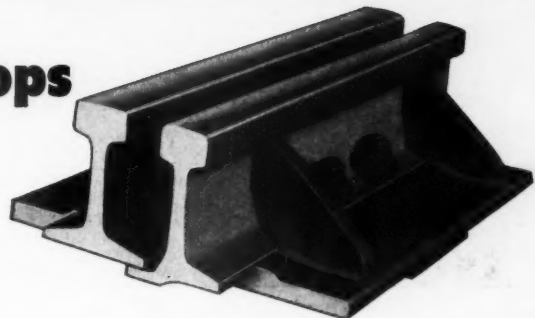


## Built to Absorb the Wallops

Bethlehem's Hook-Flange Guard Rail can't be budged by side thrust—even the sudden, lurching kind that carries a punch. The reason, aside from strength, is its unique design, which has proved itself in thousands of installations.

Essentially, the Hook-Flange Guard Rail consists of a specially-shaped rolled-steel rail bolted to special tie-plates. One flange of the guard rail fits snugly against a shoulder on each tie-plate, so that lateral movement is prevented. The other flange dips under, and is held down by, the running rail; hence the weight of the train prevents the guard rail from overturning, no matter how sharp the wheel thrust.

The installation pictured above shows the Model 750. This model is often the choice where a somewhat resilient guarding device is preferred. However,



Section of braced-type Hook-Flange Guard Rail (Model 751). This type is especially good where complete rigidity is specified.

certain railroads insist upon a completely rigid guard rail, and for this type of installation we offer the 751. In most respects it is similar to the 750, but is heavily braced in the area opposite the frog point.

Use the Bethlehem Hook-Flange Guard Rail wherever you have high-speed, main-line traffic or heavy yard service. It is available for all weights and types of rail, in any length required.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

*On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation*



## HOOK-FLANGE GUARD RAIL

Published monthly by Simmons-Boardman Publishing Corporation, 79 W. Monroe St., Chicago 3, Ill. Subscription price: United States and Possessions, and Canada, one year \$2.00 (special rate to railroad employees only, one year \$1.00). Single copies 50 cents. Entered as second-class matter January 20, 1933, at the post office at Chicago, Ill., under the act of March 3, 1879, with additional entry at Bristol, Conn. Volume 49, No. 9.

# PENTA TREATMENT WILL PROTECT YOUR INVESTMENT IN LUMBER

Clean PENTA makes wood last 2 to 4 times longer...  
cuts repair and replacement costs



The Dow Chemical Company  
Dept. PE3-3B2A, Midland, Michigan

Please send me:

- ☐ Plant wood treating specifications.
- ☐ Valuable booklet, "Pointers on Penta."
- ☐ Sources of treated wood.

Name

Title

Company

Address

City  State

It's a matter of record that PENTA\* treatment is the sure way to protect your investment in railway lumber. Because PENTA gives positive protection against decay and termites you can be sure that platforms, loading docks and car lumber will last years longer. Longer life for all your wood construction means big savings in repair and replacement costs.

This is only part of the return you will realize from PENTA-treated wood. Besides controlling decay and termites, PENTA builds good customer relations because it is *clean*. Platforms built with PENTA-treated wood are pleasing to the eye, and easy to walk on.

Workmen like *clean* PENTA-treated wood, too, because it is easy to handle.

In your choice of a wood preservative, specify *clean* \*PENTACHLOROPHENOL. Send for more detailed information today, write THE DOW CHEMICAL COMPANY, Midland, Michigan.

*you can depend on* **DOW CHEMICALS**



# In the heart of the job— on America's Leading Railroads . . .

**7** HE leading railroads of the country have proved Northwests on their maintenance-of-way and storeyard jobs. The Northwest Crawler is a real railway man's machine. Its simplicity alone makes it worth considering. The rugged design and construction with its cast steel bases and cast steel machinery side frames, stands up under heavy railway service — keeps shafts in alignment — and reduces wear. Easy operation, the result of the "Feather-Touch" Clutch Control, increases operating safety and keeps the output curve up. Northwest steering and Northwest Crawlers, with their self-cleaning action, takes Northwests where other machines have difficulty and make loading and unloading easier.

You are making long-time plans. The Northwest is the machine for the heart of your maintenance-of-way jobs and you can't afford to have anything but the best in the heart of the job! Plan to have Northwests in those Key Spots. Make it the Key Machine and your first Northwest will make you a repeat order buyer.

NORTHWEST ENGINEERING CO.  
1513 Field Bldg., 135 South LaSalle St.,  
Chicago 3, Illinois



## NORTHWEST

THE ALL PURPOSE RAILROAD MACHINE  
SHOVEL • CRANE • DRAGLINE • PULL-SHOVEL



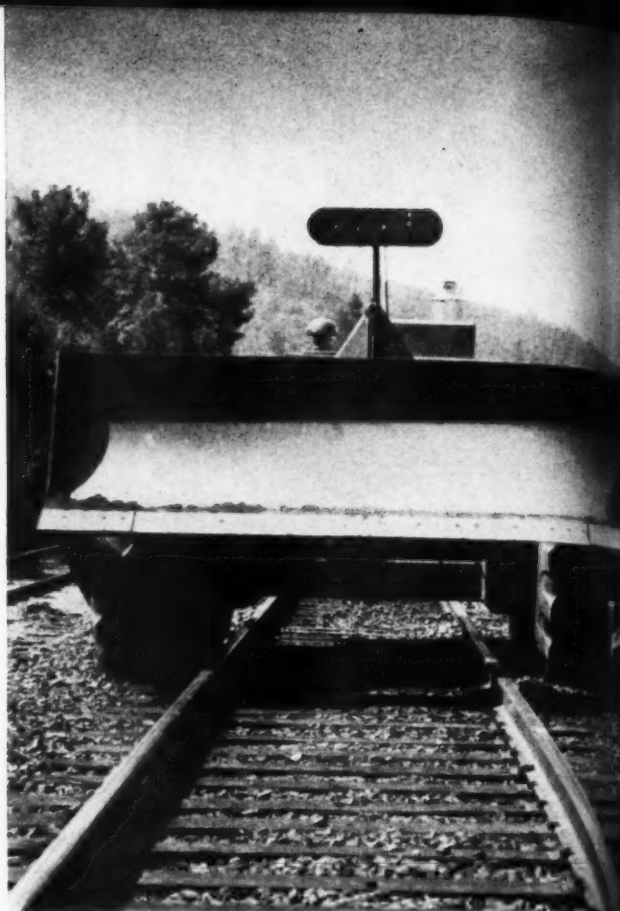


# PICTURES

show new  
high-speed method  
of Railroad maintenance



**LEVELING FOR GRADE CROSSING** along mainline right-of-way, rubber-tired Tournatractor dozes 2½ cu. yds. of clay and gravel per pass. With 19 mph forward, 8 mph reverse speeds, the one Tournatractor completed this job 2 to 3 times faster than slow-moving crawler-tractor . . . far cheaper than could a work train and crew.



**DRIVING TO NEXT JOB** at speeds to 19 mph saves delays, gets more work done. Tournatractor's big low-pressure tires straddle rails . . . travel along right-of-way . . . do not chamfer ties, tracks, switches, or trip automatic block signals. Rig crosses bridges, trestles . . . takes shortest route to next job . . . goes right to work.



**PUSH-LOADING SCRAPER**, Tournatractor's 4-wheel drive speeds construction of new railroad siding in northwestern Montana. Rig also pulls Scrapers, Sheepfoot Rollers, Rooters, Wagons, and other heavy

equipment for big dirtmoving jobs. Tournatractor's dependable electrical system supplies 120 and 220-volt current for emergency lighting or temporary equipment operation.



**TRAVELING VIA HIGHWAY** to distant maintenance or emergency tasks rig covers a mile in less than 4 minutes. This high speed simplifies dispatching. Operator just hops on and goes . . . does not have to bother with loading, blocking and unloading necessary when



**HANDLING SLIDES, WASHOUTS** and other emergency dozing is another fast job for Tournatractor. Here it clears rock slide from right-of-way. Tough treads and rayon cords absorb shock. Power travels on roller friction bearings . . . eliminates abrasive drag, repairs, and lubrication.

GRADING  
blade g

SPOTTIN  
atractor  
(torque  
air bral

WORKIN  
addition  
yards,  
snowbo





**GRADING FOR DRAINAGE**, Tournatractor's electric-control bulldozer blade gives fast, smooth dozing action. Other quick jobs: repairing

washouts . . . clearing right-of-way . . . spreading ballast . . . aligning track . . . filling in bridge approaches . . . trimming side slopes.



**SPOTTING CARS** or handling emergency switching is easy with Tournatractor. Speed changes instantly with constant-mesh transmission (torque converter optional). There is safe control in big 4-wheel disc air brakes. Fingertip electric controls reduce operator fatigue.



**STOCKPILING COAL**, cinders, ballast, or other materials, high-speed Tournatractor handles 2 to 3 times more yards per hour than crawlers. Rig's big tires again pay off . . . assure safe compaction of coal and other combustible materials without grinding them to fines . . . help reduce possibility of spontaneous combustion.

LeTourneau-Westinghouse Company, Peoria, Illinois

Gentlemen: Please send complete information on LeTourneau-Westinghouse machines checked below:



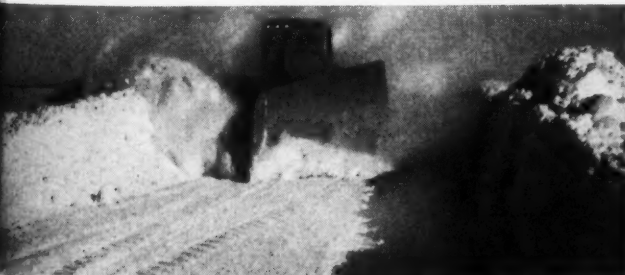
☐ Rubber-tired 186 hp Tournatractor



☐ 122 hp Tournapull-Scraper

Check picture above for tools in which you are interested and send in coupon. We'll be glad to arrange a demonstration on your division at your convenience.

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_



**WORKING YEAR 'ROUND**, Tournatractor plows snow in winter. With addition of V-type Snow Plow, rig easily busts deep drifts . . . opens yards, sidings, loading tracks, or access roads. Can travel around newbound equipment, open line from either side. Interchangeable



IT'LL PAY YOU TO INVESTIGATE THE  
NEW **Bantam Crawler**  
... at the lowest price in the Industry

**\$9,350**

F.O.B. Factory  
- Basic Crawler  
with 1400 Lb.  
Counterweight,  
less attachment  
(Price subject to  
change.)

**CAN YOU AFFORD**

**NOT TO OWN**

Get a "\$'s and Sense"  
**On-YOUR-Job**  
**Demonstration**

**A C-35?**

ask your Bantam Distributor or  
write factory now!

5 TON  
3/4 Cu. Yd.  
MODEL  
**C-35**



Only Bantam gives you these Design Features at \$9,350

**TWO-SPEED INDEPENDENT TRAVEL ENABLES** the operator to move at varying speeds, forward or backward, while operating the front end attachment.

**LOW GROUND-BEARING PRESSURE** - 2 pad sizes available - 5 lbs. per sq. in. with 16" pads - 3 1/2 lbs. per sq. in. with 24" pads.

**BIG MACHINE STABILITY** - Longer, wider tracks - and a low center of gravity gives greater lifting capacity.

**HIGH SPEED OPERATION** features immediate acting straight mechanical controls, easy positive breaking action, fast line and swing speeds.

**FAMOUS BANTAM FEATURES** - Power boom hoist, machine cut gears, anti-friction bearings, 4 hook rollers, greater visibility.

**94-INCH OVER-ALL WIDTH** allows the Bantam to be moved from job to job on standard trailers without special highway permits.



**Write for FREE**

**C-35 SPECIFICATIONS BOOKLET**  
Form C-100



**SCHILD**  
**Bantam**  
COMPANY • 284 PARK ST., WAVERLY, IOWA, U.S.A.

SB-CCR-3

**ANOTHER NEW PRODUCT OF THE WORLD'S LARGEST PRODUCER OF TRUCK CRANES AND EXCAVATORS**



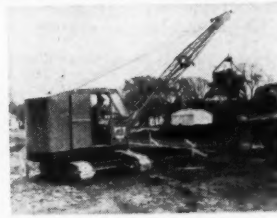
**BACK HOE** - Crawler working in heavy mud crawls out after trenching with no trouble. C-35's flotation enables Bantam to work in all kinds of weather under rugged underfoot conditions of muck, mud and sand.



**SHOVEL** - Handles up to 100 cu. yds. per hour from stockpile ... up to 90 cu. yds. excavating in average material. Automatic dipper trip means quick, effortless dumping. Also available with 1/2 cu. yd. rehandling bucket.



**DRAGLINE** - Digs 90 cu. yds. per hour in average material. Available with perforated or solid buckets. Ideal for gravel pits, ditch cleanout, cutting new drainage ditches, basement excavations, stockpiling, pits, etc.



**CLAMSHELL** - Ideal for material handling and loading out of stock-pile ... precision excavating of bell holes, special excavating on pipeline jobs, clean-out of trenches. Handles up to 80 cu. yds. of average bulk material per hour.

**CLASS OF SERVICE**

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable symbol above or preceding the address.

# WESTERN UNION

W. P. MARSHALL, PRESIDENT

FX-1201

**SYMBOLS**

DL = Day Letter  
NL = Night Letter  
LT = Int'l Letter Telegram  
VLT = Int'l Victory Ltr.

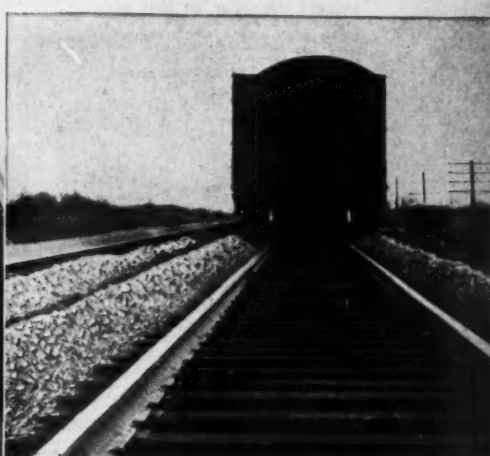
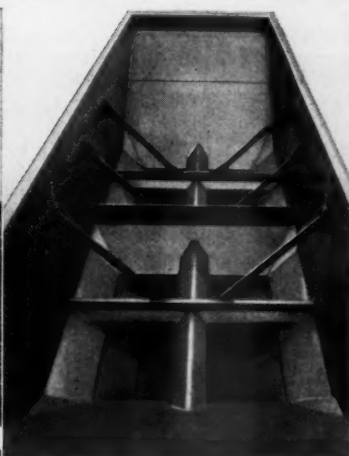
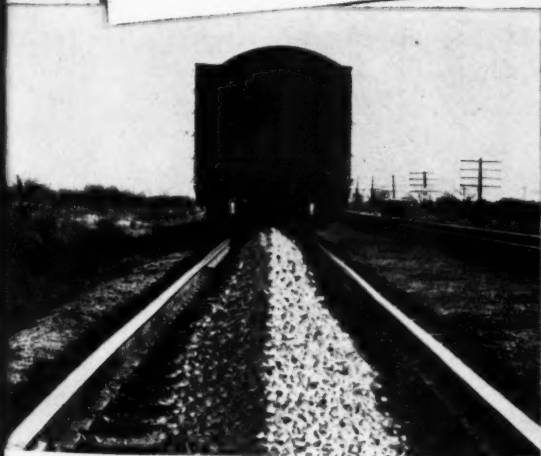
The filing time shown in the date line on telegrams and day letters is STANDARD TIME at point of origin. Time of receipt is STANDARD TIME at point of destination

MR. RAILROAD EXECUTIVE

THE USE OF ENTERPRISE BALLAST CARS ON YOUR RAILROAD WILL SAVE YOU TENS OF THOUSANDS OF MAN HOURS IN YOUR MAINTENANCE OF WAY PROGRAM WITH AVERAGE LABOR COSTS OF ONE DOLLAR AND FORTY SEVEN CENTS PER HOUR SAVINGS WILL BE SUBSTANTIAL THE ENTERPRISE BALLAST CAR IS ALSO AN IDEAL COMMERCIAL CAR FOR COAL SAND GRAVEL SUGAR BEETS AND OTHER BULK LADINGS.

ENTERPRISE RAILWAY EQUIPMENT COMPANY

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE



The Enterprise ballast car distributes ballast exactly where needed  
—center, either side, or any combination of center and side.

4432 S

*Door Operating Devices Exclusively Since 1903*

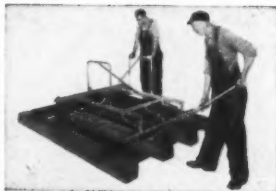
## ENTERPRISE RAILWAY EQUIPMENT COMPANY

59 East Van Buren Street • Chicago 5, Illinois

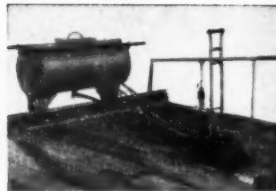




**WOOLERY** self-propelled off-track Joint Oiler with three operators can spray joints on 1½ miles of track per hour. Uses heavy lubricants heated in 25-gallon tank and sprayed into joints under pressure, for thorough, long-lasting economical lubrication. Only 30" wide, to operate easily or turn around between double tracks.



**WOOLERY** Tie Plate Spacer quickly and accurately locates single or double shoulder plates at exact position on ties. Light in weight so that one man can easily handle it on or off track. Simple adjustment allows for changes in rail sizes. Ruggedly built for long service, this machine greatly speeds the job of rail laying.

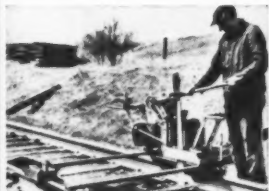


**WOOLERY** Creosote Sprayer, with 60 gallon tank capacity. Equipped with generator burner to heat creosote, and wind protection hood to safeguard operators, it applies a metered amount of creosote to each freshly-laid tie. Does a safer, more economical and uniform job than is possible by old fashioned hand swabbing or broom-and-pail methods.

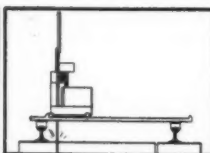
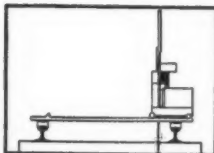
Manufacturers of Tie Cutters, Tie End Removers, Tie End Trimmers, Power Bolt Tighteners, Spike Drivers, Motor Cars, Push Cars, Tool Transporters, Weed Burners, Extinguisher Cars, Chemical Sprayers, Tie Plate Spacers, Creosote Tie Sprayers, Rail Wipers, Flangeway Cleaners, Rail Joint Oilers, Power Joint Lubricators.

## WOOLERY MAINTENANCE MACHINES for Better Track & LOWER COST!

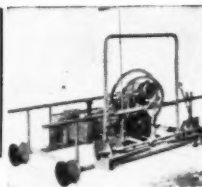
### The WOOLERY Team for Greater Savings in Tie Renewals!



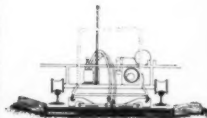
The **WOOLERY** Tie Cutter provides a proven money-saving method of removing old ties without trenching, jacking up track, or adding tops of rail-cut ties.



After tie has been cut on both sides, the operator of the **NEW WOOLERY TIE END REMOVER** removes center section in the usual manner with tie tongs and then moves the **NEW WOOLERY TIE END REMOVER** into position and



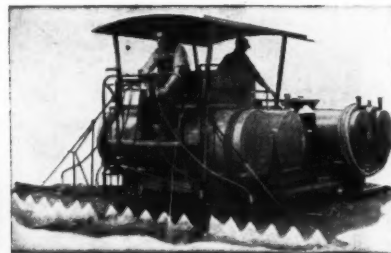
drops the double-ended hydraulic cylinder into the tie-bed. A simple turn of the valve pushes the tie-end completely clear of the rail.



**WOOLERY 300** Motor Car gives advantages of a light car, plus greater pulling power with 4 wheel drive and heavy duty performance. Carries 8 men and track tools. Can be fitted with detachable **WOOLERY** Flangeway Cleaner for winter duty.



**WOOLERY** Model PB-B Weed Burner will destroy a swath of weeds 15 feet wide in one trip or up to 25 feet with burner arms extended on second run. All three burners have electric ignition and individual controls. Only two operators required. Other **WOOLERY** Weed Burners in 1-burner and 5-burner models.



**WOOLERY** dual purpose Combination Sprayer and Weed Burner permits choice of chemical spraying (near buildings or in areas where burning is not practical) or weed burning, as desired. Chemical sprayer, covers 18-foot swath. Burning unit at opposite end covers 15 feet first trip; up to 25 feet second trip.

SINCE 1917 RAILWAY MAINTENANCE EQUIPMENT

# Woolery

## MACHINE COMPANY

2919 COMO AVE. S. E. MINNEAPOLIS 14, MINN.

Exclusive Export Representatives  
PRESSED STEEL CAR CO., NEW YORK, N. Y.

### NEW WOOLERY TRACK TOOL TRANSPORTER



This handy, lightweight push car carries tools to the job site from unloading point. Men don't have to tote tools and equipment—save time and muscles for the important job!



## 2,4,5-T FORMULATIONS



**GET TO THE  
ROOTS OF YOUR PROBLEM**

When brush begins to choke your right of way, release its grip with formulations of 2,4,5-T.

This potent herbicide eliminates mesquite, poison ivy, poison oak, barberry, brambles and many other woody and unwelcome plants. At the same time, it permits the growth of grass and low-growing cover plants that prevent erosion.

Deadly to brush, 2,4,5-T formulations are non-

toxic to man or animals. Economical, too... effective in low concentrations. And easy to apply with ordinary knapsack sprayer, truck, tractor or trailer-mounted equipment.

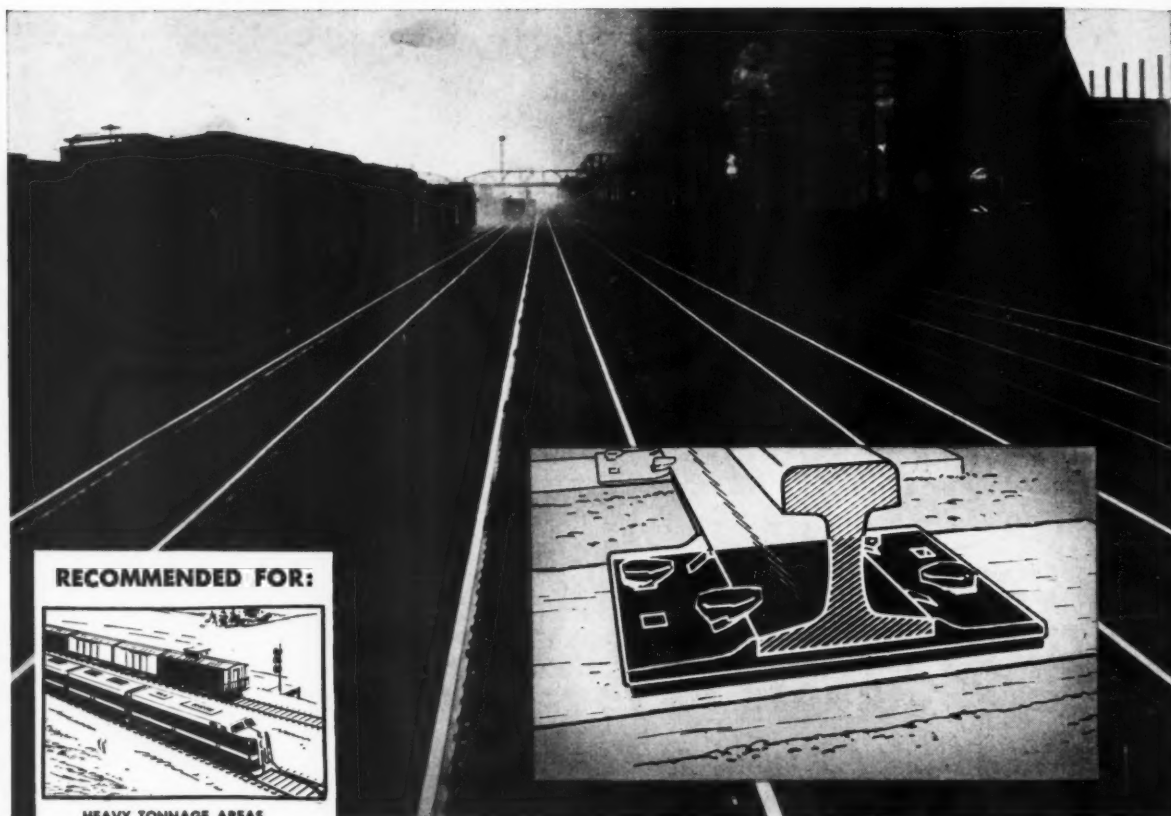
Don't waste time, money, labor clearing land by manual methods. Let 2,4,5-T do the job for you *chemically*. Faster, more effectively, more economically. Your dealer can supply you.

**ETHYL** CORPORATION  
*Chemicals for industry & agriculture*

100 PARK AVENUE, NEW YORK 17, N. Y.

ATLANTA, BATON ROUGE, CHICAGO, DALLAS, DAYTON, DENVER, DETROIT, HOUSTON, KANSAS CITY, LOS ANGELES, NEW ORLEANS, PHILADELPHIA, PITTSBURGH, SALT LAKE CITY, SAN FRANCISCO, SEATTLE, TULSA, MEXICO CITY AND (ETHYL ANTIKNOCK, LTD.) TORONTO.





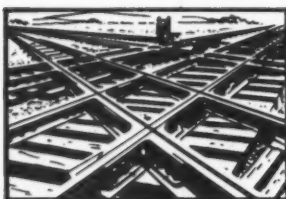
**RECOMMENDED FOR:**



HEAVY TONNAGE AREAS



CURVES, TRESTLES AND BRIDGES



CROSSINGS, INSULATED JOINTS



THROUGH STATION AREAS

## *Lengthen Tie service life*

### **with Johns-Manville Tie Pads**

- ... prevent tie cutting
- ... cushion track structure

BECAUSE they reduce cutting, abrasion and the action of moisture, Johns-Manville Tie Pads protect your tie investment... help cut maintenance costs. This is especially important in heavy service areas where tie replacement is a serious recurrent problem.

Designed to prolong tie service life, J-M Tie Pads reduce "pumping," track spikes stay tight longer, postponing maintenance expense for regauging and respiking. Resilient, they serve as durable protective cushions, seal out dirt and moisture, prevent abrasion and cutting. J-M Pads absorb impact shock,

help isolate the transmission of noise and vibration,

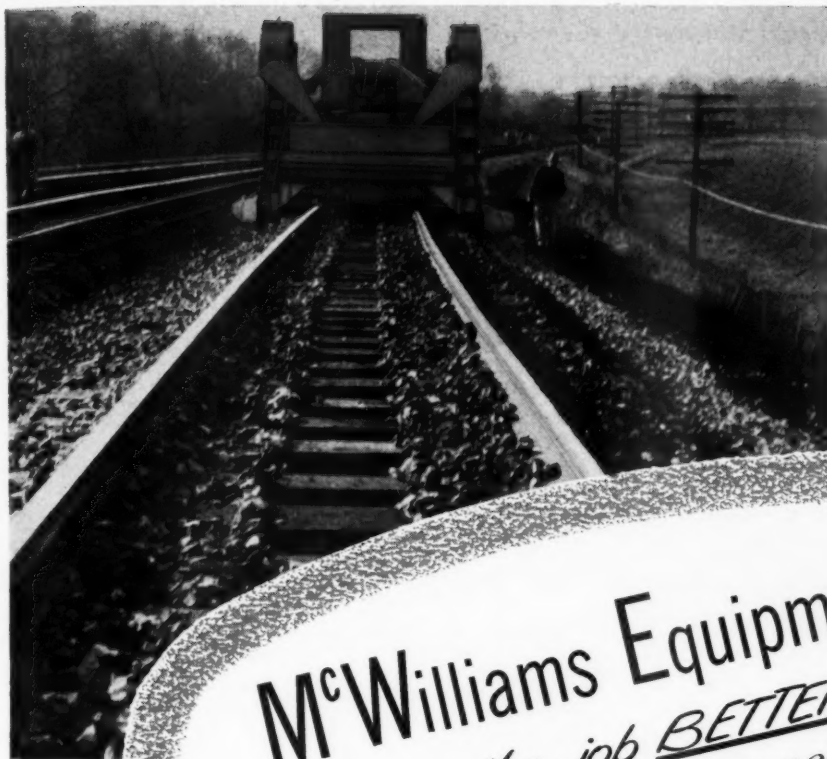
J-M Tie Pads are formulated to offer low compressibility, high recovery, low plastic flow, good resiliency and flexibility over the widest temperature ranges encountered in service. These pads are resistant to creosote, diesel and lubricating oils, brine, water and freezing and thawing.

**Available in all standard sizes, J-M Tie Pads** are furnished uncoated or with a special asphalt adhesive coating on one side. For detailed information on Tie Pads or other Johns-Manville products get in touch with your J-M Representative, or write Johns-Manville, Box 60, New York 16, N. Y.



# Johns-Manville

**95 YEARS OF SERVICE  
TO TRANSPORTATION**



## McWILLIAMS BALLAST DISTRIBUTOR

This machine places ballast in the desired quantity in exactly the proper place for tie tamping. In service it replaces a crew of from 30 to 40 men forking ballast, doing the job faster, better and more economically. The track ahead of the Ballast Distributor always is clear for renewing and replacing ties. Machine will also dress shoulder and intertrack.

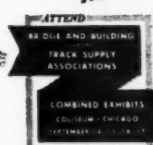
**McWilliams Equipment**  
*Does the job BETTER  
...with fewer men!*

## McWILLIAMS TIE TAMPER

Operating by controlled pressure, this unit compacts the ballast firmly under the rail without crushing the ballast. It operates at from 450 to 550 feet per hour of perfectly tamped track, and is the most versatile and efficient tie tamper ever developed.



SEE BOTH  
MACHINES



VISIT OUR BOOTHS 79, 80, 81, 99, 100, 101.

# Railway Maintenance Corporation

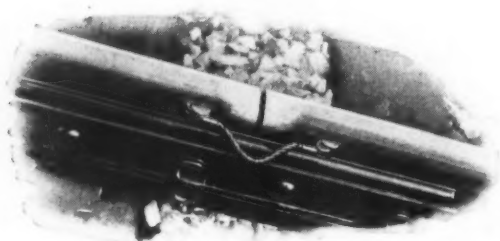
PITTSBURGH 30, PA.

DESIGNERS AND MANUFACTURERS OF: McWILLIAMS MOLE AND SUPER MOLE . . . McWILLIAMS TIE TAMPER, CRIB CLEANER AND BALLAST DISTRIBUTOR . . . R. M. C. RAIL JOINT PACKING

# WHAT ARE YOUR REQUIREMENTS FOR END-HARDENED RAIL



Adequate Hardness?  
Desired Toughness?  
Correct Hardness Pattern?  
Best Depth of Hardness?



*You get all these with  
OXWELD'S methods for oxy-acetylene  
rail-end hardening*

OXWELD's methods of flame-hardening are backed by 15 years of experience. During that time millions of rail ends have been treated by this tried-and-tested method.

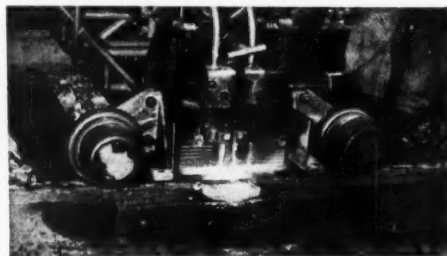
On many railroads it is standard practice to flame-harden rail ends as new steel is laid. This results in considerable savings because additional flagmen are not required and as the signal bonds are not in place it is not necessary to protect them. On other railroads the manual baffle box method has proved to be efficient, especially for small programs.

You cannot afford to overlook the proved economies of OXWELD's end-hardening methods.

Write for Booklet 7007 which details technical data on end-hardening as well as flame-hardening frogs.



Manual baffle box method of end-hardening is useful in places where traffic is dense.



Machine method of end-hardening gives high production at low cost.

## OXWELD RAILROAD SERVICE COMPANY A Division of Union Carbide and Carbon Corporation



Carbide and Carbon Building Chicago and New York  
In Canada:  
Canadian Railroad Service Company, Limited, Toronto



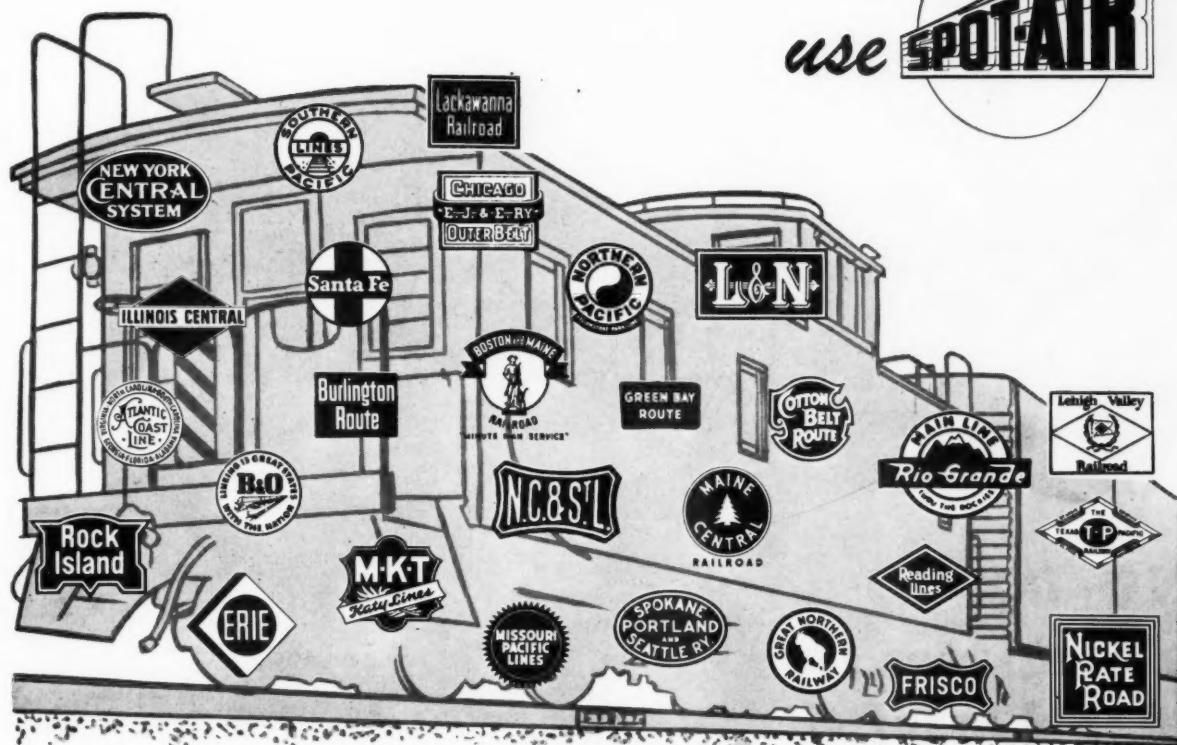
SINCE 1912—THE COMPLETE OXY-ACETYLENE SERVICE FOR AMERICAN RAILROADS

The term "Oxweld" is a registered trade-mark of Union Carbide and Carbon Corporation.



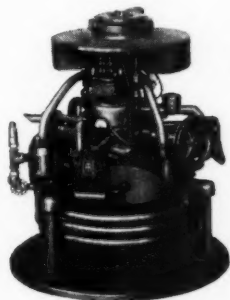
# These leading railroads

use **SPOT-AIR**



for....

- TIE TAMPING
- SPIKE DRIVING
- BOLT TIGHTENING
- WOOD BORING
- PAINT SPRAYING
- ROCK DRILLING
- CONCRETE BREAKING



◀ Type 3R-36  
Weight: 265 pounds  
32 inches high  
27 inches wide

▶ The 3R-36  
SPOT-AIR  
operating  
four MT-4  
tie tampers.

## Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y. 764-2

A coast-to-coast network of the country's leading railroads now depends on the SPOT-AIR compressor to furnish air power for their section gangs. It can easily handle four Ingersoll-Rand MT-4 tie tampers or a wide range of I-R air tools for roadbed work, bridge and building, and grade crossing maintenance.

Although the 3R-36 SPOT-AIR stands only 32 inches high on a 27 inch baseplate, it delivers rated 36 cfm of free air at 80 psi. This 265 pound, gasoline-driven compressor is easily transported on its own wheelbarrow mounting or on a section-car.

Your nearest Ingersoll-Rand representative will be glad to give you the full story on the versatile SPOT-AIR compressor and the air tools it operates.





***It costs money to  
repair this bridge.....***

**NO-OX-ID  
eliminates this  
metal loss!**



Replacing rust-ruined steel bridge members is expensive . . . it's unnecessary, too! Because you can conserve vital materials and man-hours by preventing corrosion with NO-OX-ID Rust Preventives.

Wherever metal surfaces are exposed—on bridges, water tanks, structures, railroads—wherever steel is used, NO-OX-ID prevents rust with one coat. No expensive re-scaffolding is required. Ask your Dearborn Engineer to recommend the NO-OX-ID combination best suited to solve your corrosion problems.

***Send for informative  
NO-OX-ID bulletins***

A series of valuable and informative bulletins describing how NO-OX-ID's are used to control corrosion are available to you. Your copies will be mailed promptly on request.

**Dearborn**

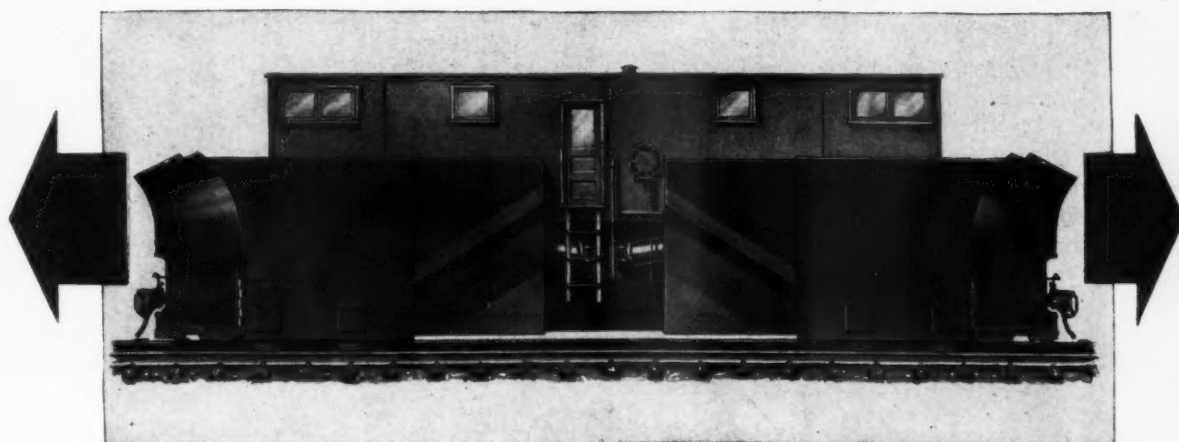
DEARBORN CHEMICAL COMPANY  
MERCHANDISE MART PLAZA  
CHICAGO 54, ILLINOIS

**THE ORIGINAL  
RUST PREVENTIVE**

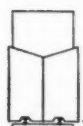
**NO-OX-ID**

**PLOWS BOTH WAYS**

**ELIMINATES COSTLY TURN-AROUND TIME!**



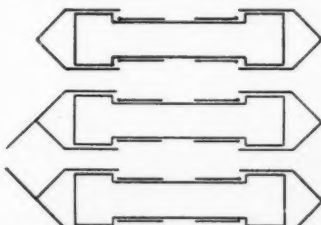
## The **NEW** Jordan "TWIN-TYPE" SNOWPLOW



Front snowplow flanges even below rail tops—leaves clean rail surface for better traction.



Here's the front snowplow in travelling position—high above rail tops.



Adjustable front snowplow wings enable you to plow to both sides at once, or to a single side.



Pneumatically operated snow wings on sides of car extend way out—provide a wide path for equipment clearance.

Here is the answer to the trend away from use of turntables and similar turn-around facilities: the new Jordan "Twin-Type" Snowplow. It's double-ended . . . eliminates costly turn-around time . . . and each end has all the rugged reliability and operating features that have made Jordan snowplows famous.

- Arrow-ended welded underframe for maximum strength, even out to tip of front snowplows.
- Cab is insulated; has provision for heating if desired.
- Controls at each end of cab.
- Maximum visibility and comfort for operators.

*Like to know more? . . . Use this handy coupon.*

### **JORDAN** SPREADERS • DITCHERS • SNOWPLOWS

O. F. JORDAN COMPANY • East Chicago 3, Indiana


Please send free "Twin-Type" Snowplow data.

Name & Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City-Zone-State \_\_\_\_\_



## G-E snowmelters give fast, flameless defense against snow-clogged switches

G-E snowmelters offer you fast, no-fuss protection against snow-clogged switches. Clamped directly under the head of the rail, they melt ice and snow quickly without any open flame to endanger personnel or property.

G-E snowmelters are left in place all year 'round, ready to go to work at a snap of the remote-control switch. Easy to maintain, G-E snowmelters require neither refueling nor constant attention.

Plan now for your snowmelting needs. Before you submit your 1954 budget, ask your nearest General Electric sales representative for full details on G-E snowmelting systems. General Electric Company, Schenectady 5, New York.

152-50

*You can put your confidence in—*  
**GENERAL  ELECTRIC**





# Multiply muscle power with **GARDNER-DENVER Air Power**



Sheeting Drivers



Clay & Trench Diggers



Backfill Tampers



Paving Breakers

Portable Compressors

Gardner-Denver Portable Compressors for continuous air supply any day in the year—at any altitude.

Gardner-Denver Air Tools for easy holding—safe handling—low operating and maintenance costs.

Get the complete facts and see! Write today.

SINCE 1859

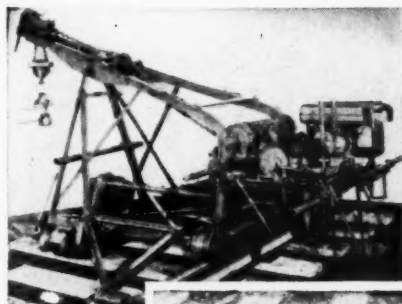
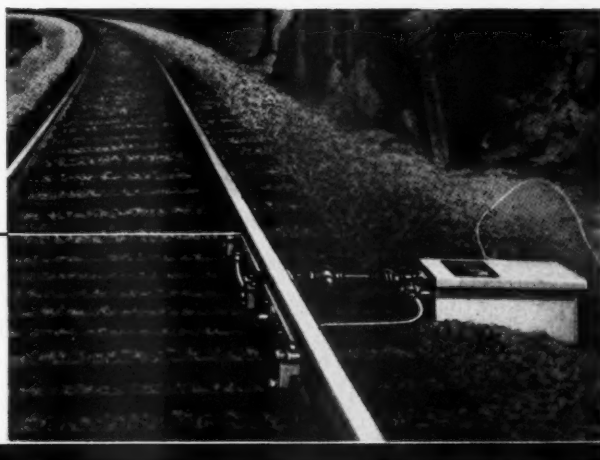
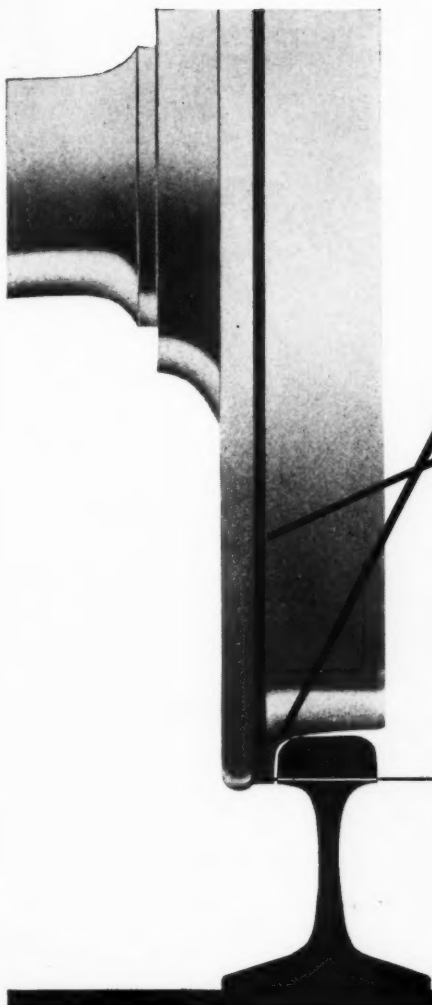
## **GARDNER-DENVER**

Gardner-Denver Company, Quincy, Illinois  
In Canada: Gardner-Denver Company (Canada), Ltd.,  
14 Curity Avenue, Toronto 13, Ontario

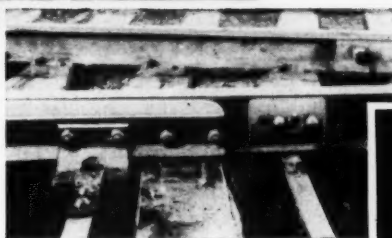
THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS



# lubricates rail and wheel flanges



MECO POWER  
RAIL LAYER —  
lays standard  
or mile-long  
"Ribbonrail."



MACK REVERSIBLE SWITCH POINT  
PROTECTOR — prolongs life of switch  
rails 4 to 5 times, then it is removed,  
reversed and extends the life of the  
switch rail another 4 to 5 times.

G-189R

Meco Curve Rail Lubricators apply grease between the rail head and wheel flanges, reducing friction and wear on wheel flanges and curve rails.

Lubrication prolongs the life of wheels and curve rails and makes it possible to negotiate curves at high speeds with perfect safety.

Result—longer life for curve rails, car and locomotive wheels.

## ★ Maintenance Equipment Company ★

RAILWAY EXCHANGE BUILDING • CHICAGO 4, ILLINOIS



RYD-IN AUTOMATIC COUP-  
LER — for securely coupling  
trailers to motor cars.



# Clear the Track

WITH

## CHIPMAN WEED KILLERS

**to Clear the Way for Better,  
Labor-Saving Maintenance**

Successful control of weeds, grass and brush means better track maintenance at lower cost. This requires *proven* chemicals, plus the know-how to select and apply them. We offer a broad line of proven weed killers, together with over 40 years of experience in application service. Note, too, our strategically located plants.

Call on us any time regarding your weed control problem.

**14**  
**Strategically Located  
Chipman Plants**

ATTENTION  
RAILROAD AND BUILDING  
TRAFFIC SUPPLY ASSOCIATIONS

COMBINED EXHIBITS  
CHICAGO - CHICAGO  
SEPTEMBER 10, 11, 12, 13

Visit Our Booth  
48 and 49



**CHIPMAN CHEMICAL COMPANY, INC.**  
*Manufacturers of*  
**ATLACIDE • CHLORAX**

**A Complete Line of Weed, Grass and Brush Killers**

... for maintenance and construction

# JACKSON MULTIPLE TAMPERS

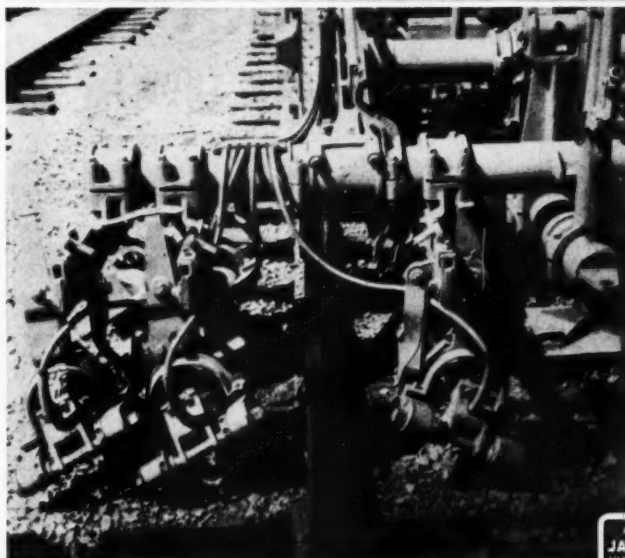
... long ago established a standard of uniformity and excellence of tie tamping which remains unmatched today.

Moreover, in any ballast, and in any lift from that which is slightly lower than the maximum size of the ballast used to the very highest, Jackson Multiple Tie Tampers will put up perfect track at less cost than can be achieved by any other means.

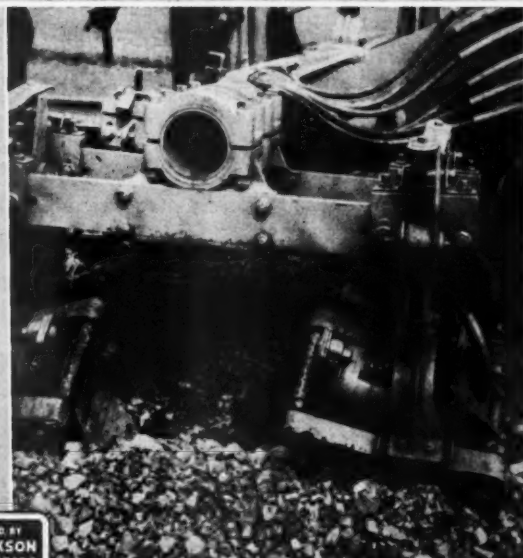
These are facts which you can verify on your own line. We will be glad to place a Jackson Multiple with you on a rental basis, with rental to apply on optional purchase.



BOOTH Nos. 123—126  
142—144



RIGHT UNDER THE RAIL



WAY UNDER THE TIE



Sold in U.S.A. by **ELECTRIC TAMPER & EQUIPMENT CO.** Ludington, Mich.

CANADIAN REPRESENTATIVES: MUMFORD, MEDLAND, LIMITED—WINNIPEG, MAN.

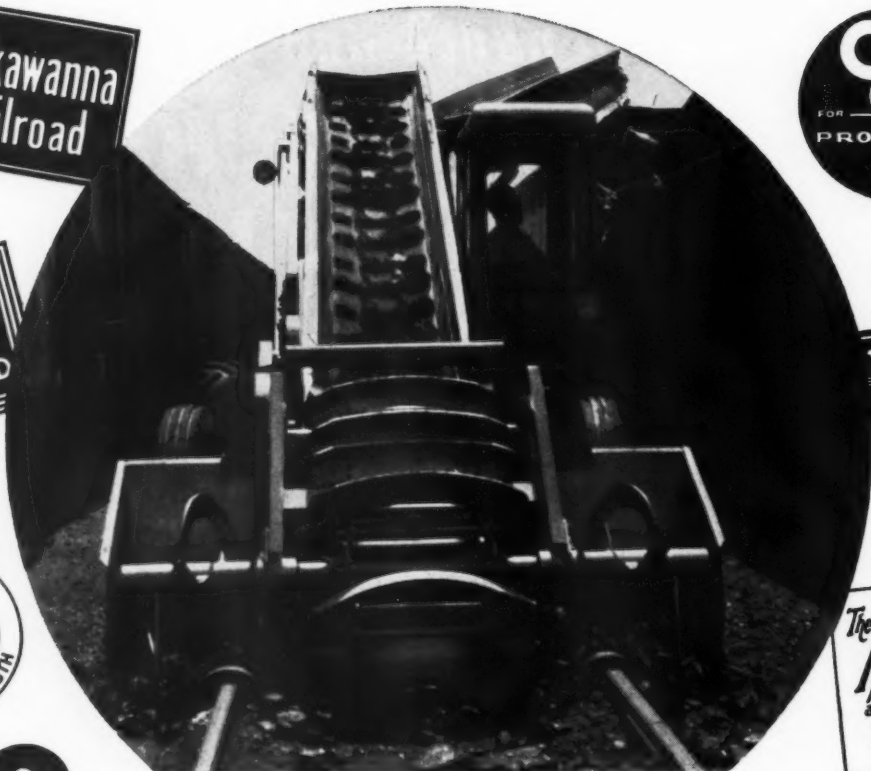
Lackawanna  
Railroad

NICKEL  
RATE  
ROAD



L&N

The New York  
New Haven  
and Hartford  
RAILROAD CO.



# SEE THE TRACK CLEANING CHOICE OF LEADING RAILROADS... THE *Athey* HiLoader

**TRACK CLEANER WORKING AT THE RAILROAD SHOW!**

**SEE** the only Track Cleaner that can load 10 to 25 cu. yds. every minute of the day . . . the 18' conveyor swinging 55° to either side to load your highest hopper cars . . . the extra-wide feeder that cleans full length of ties. Get in the operator's seat to feel how easily you can operate all controls with unobstructed view of both

cleaning and loading ends.

**SEE** how the Athey Force-Feed Hi-Loader is built, how it works and how it has served other roads. Ask the Athey representative at the exhibit about a demonstration in your yard!

*Athey*

PRODUCTS CORPORATION

5631 W. 65th Street • Chicago 38, Illinois

**SEE THE**

**Athey Force-Feed HiLoader Track Cleaner**

Inquire at the Caterpillar-Athey Exhibit, Booth Nos. 92 through 96 and 112 through 116, at the Railroad Show, Chicago, Illinois, September 14th through 17th.



# Off-track compressor-tractor takes air power anywhere



**Saves time  
and money**

*on tie-  
tamping*

**and many other  
M/W jobs**

## LE ROI **TRACTAIR**

**provides versatility for extra hours of usage**

**Do all these jobs — and more — with Tractair:**

- Tamp ties; drive spikes.
- Break pavement.
- Drive mail point for grouting operation.
- Do ditching, light grading, weed mowing.
- Drive earth augers.
- Stockpile ballast, cinders, other materials.
- Handle off-season work for B&B, Signal, T&T, and Water-Service Departments.

Le Roi-CLEVELAND No. 10 Tie Tamper, shown at right, weighs only 36 lbs. Section hands like it and can handle it without tiring. The work is faster and more uniform.



TRACTAIR'S low-cost, mobile air power lets you make more use of work-saving Le Roi-CLEVELAND air tools. For example, Tractair delivers enough air to run eight standard tie tampers — helps your section hands tamp fast and uniformly.

By using other attachments, your men multiply Tractair's usefulness. They can use it to lift, load, auger, mow, backfill, power a winch, plow snow, and do the work of other specialized equipment.

Yes, sir, this combination 105-cfm

compressor and 35-hp tractor is adaptable to many M/W jobs. It has good traction and low center of gravity—can be driven almost everywhere. It readily crosses or straddles heavy-duty rail. It climbs embankments and works on a two-to-one slope with safety.

We'd like to show you Tractair at work, so you can get a first-hand picture of its money-saving usefulness. Just write and tell us when it's convenient. And — ask for job-data sheets and bulletins.

## LE ROI COMPANY

A Subsidiary of Westinghouse Air Brake Co.  
RAILROAD SALES DEPARTMENT

327 SOUTH LA SALLE STREET • CHICAGO 4, ILLINOIS

T-28



Tractair operates air-motor-driven auger up to 16" diameter. Hydraulic control keeps auger at desired angle. Horizontal auger also available.



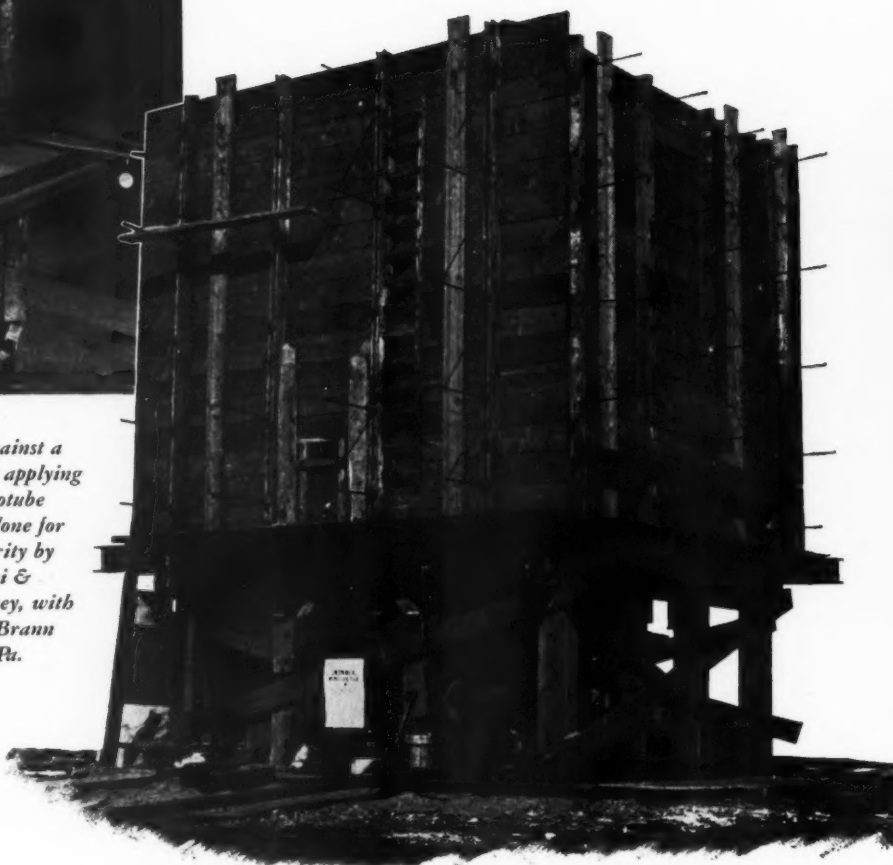
Front-end loader is attached to Tractair in only a few minutes, cuts the cost of handling ballast, cinders, other materials.



A backfill blade adapts the versatile Tractair for such jobs as filling trenches, light grading, and other light dosing work.



*4 hydraulic jacks bearing against a huge sand-filled crib, used in applying 250-ton load to a single Monotube pile. This testing work was done for Delaware River Port Authority by consulting engineers Modjeski & Masters—Ammann & Whitney, with pile driving and loading by Brann & Stuart Co., Philadelphia, Pa.*



## 250-TON PROOF of Monotube load-bearing performance



*Monotube Foundation Piles*

**I**N recent predesign pile loading tests, for a proposed new bridge across the Delaware at Philadelphia, Monotube tapered steel piles again demonstrated remarkable load bearing capacity. A single Monotube pile with an 8" tip and 18" butt was driven 73 feet into a dense stratum of sand and loaded to 250 tons with a net settlement of only  $\frac{1}{4}$  inch. The gross settlement was  $\frac{3}{4}$  inches and the recovery

when the load was released was  $\frac{1}{4}$  inches.

Monotubes offer many other advantages. Exceptionally strong but light in weight, they drive fast and plumb. There's no need for special rigs or heavy driving equipment. On-the-job extendibility, quick cut-off and easy handling save plenty of dollars, too! But get *all* the facts. Just write to The Union Metal Manufacturing Co., Canton 5, Ohio.

# UNION METAL

# Announcing...



## ***FIRST SHOWING—***

**TRACK SUPPLY SHOW • Sept. 14-17 • Booths 24N-26N**

**Chicago Coliseum—North Hall**

- Oversize track-climbing tires and power steering—enables Gradall to go anywhere—on the track, off the track, on right of way, on the highway.
- Crosses track without cribbing or blocking. Never ties up traffic—moves off the track instantly.
- Straddles track—drives right down the track giving you maintenance for every mile—even in tunnels.
- 50% heavier for even greater stability—tip-proof *without* outriggers.
- Retains all Gradall features: Full hydraulic control, versatile "arm-action" boom, and job-proved quick-change attachments.
- Specially designed for railroads in response to your demands for an even more versatile maintenance-of-way machine!

**Gradall Distributors in over 75 principal cities  
in the United States and Canada**

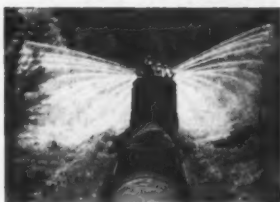


YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY



# Complete

## BRUSH and WEED KILLING SERVICE



PIONEER in the improved right-of-way brush control

Spraying equipment specifically designed and proven for the purpose



LEADER in effective grass and weed killing control



*Service For  
Your Railroad*

**Spray Services**  
*Incorporated*

- TCA • OILS • 2, 4-D
- PENTACHLOROPHENOL
- BRUSH KILLERS

Pioneers in Right-of-Way Spraying  
P. O. BOX 5444 HUNTINGTON, W. VA.

# *There's a* **BROWNING CRANE** *Designed for Your job!*

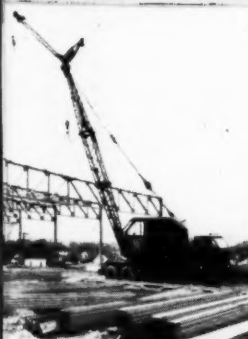
**BROWNING'S**  
are Star  
Performers  
on these jobs



CAR LOADING



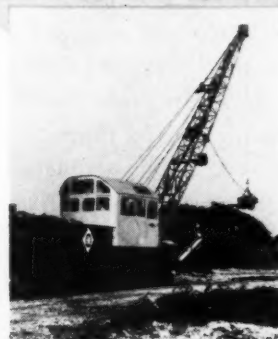
MAINTENANCE-OF-WAY WORK



STEEL ERECTING



Stock-piling materials on one of many jobs for a midwestern railroad, this 30-Ton Browning Diesel Locomotive Crane is equally versatile on maintenance-of-way work, bridge and culvert construction, pile driving and similar railroad operations.



SCRAP HANDLING & SWITCHING

**T**EN basic models for heavy-materials handling with almost unlimited combinations of capacities, booms and equipment enable Browning to deliver a crane exactly suited to your needs. This wide selection assures you the right type of crane with ample power and capacity for your job. It also eliminates the necessity of over-investment in a crane larger than you need.

Brownings are the star performers of the power-crane industry . . . that's why crane men everywhere will tell you "You can't go wrong with a Browning on the job."

Write for complete specifications on the Browning model designed for your job.

**WAGON CRANES**  
2 Models  
17½ to 25 Tons  
25 to 100 Ft.  
Booms



**TRUCK CRANES**  
5 Models  
8 to 30 Tons  
25 to 120 Ft.  
Booms



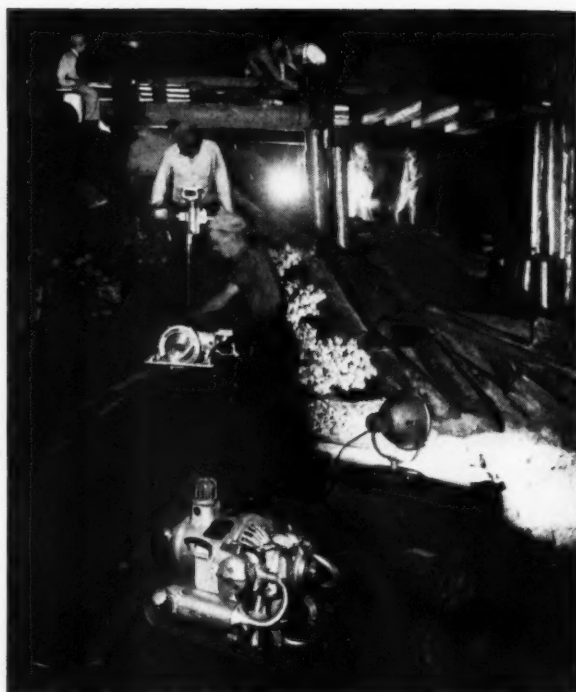
**LOCOMOTIVE CRANES**  
3 Models  
25 to 50 Tons  
50 to 135 Ft.  
Booms



**THE BROWNING CRANE & SHOVEL CO.**  
Dept. G • 16226 Waterloo Road • Cleveland 10, Ohio

**BROWNING**  
LOCOMOTIVE, WAGON  
TRUCK AND CRAWLER *Cranes*

# Cut Maintenance Costs RIGHT AROUND THE CLOCK



## with **HOMELITE** Carryable **GENERATORS**

Homelite Gasoline Engine Driven Generators have no hours. They work for you anytime, any place . . . day and night; in the yards and out on the line . . . speeding maintenance work. They operate your electric hand tools. They

operate brilliant floodlighting. And they're small and portable enough to be put into operation quickly and easily whenever and wherever you need them.

Especially suited for railroad maintenance is the Homelite Dual

Purpose Generator, the first to provide power for every type of hand tools . . . both high cycle and standard universal hand tools . . . as well as brilliant floodlights. Ask for a free demonstration, today.

Manufacturers of Homelite  
Carryable Pumps • Generators  
Blowers • Chain Saws



209 RIVERDALE AVENUE • PORT CHESTER, N. Y.

Canadian Distributors: Terry Machinery Co., Ltd., Toronto, Montreal, Vancouver, Quebec.



# men over 45

More than six times as many men of your age will die of lung cancer this year as died in 1933, according to official reports. Though our research scientists are making every effort to discover the reason for this increase, they still don't know the answer.

They *do* know, however, that the lives of over half of those who will develop lung cancer *can* be saved . . . if they get proper treatment while the disease is still in the silent stage, before any symptoms have appeared.

That is why we urge you to have a chest X-ray every six months when you have your regular health check-up . . . no matter how well you may *feel*. Since only an X-ray can detect the "silent shadow" in its earliest stages, it is your best insurance against death from lung cancer.

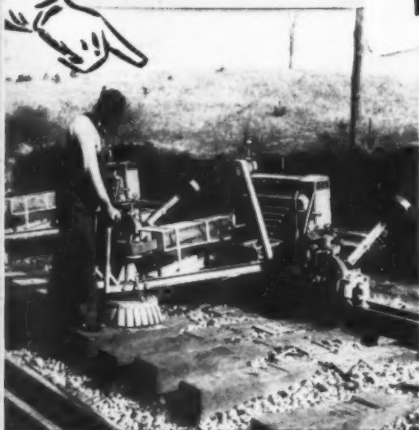
For more detailed information about this or any other form of cancer, call our nearest office or simply address your letter to "Cancer" in care of your local Post Office.

*American Cancer Society*

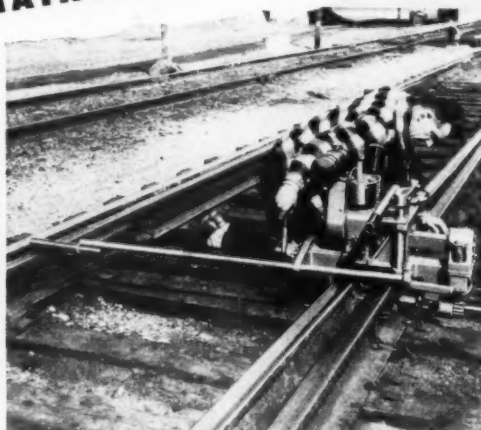




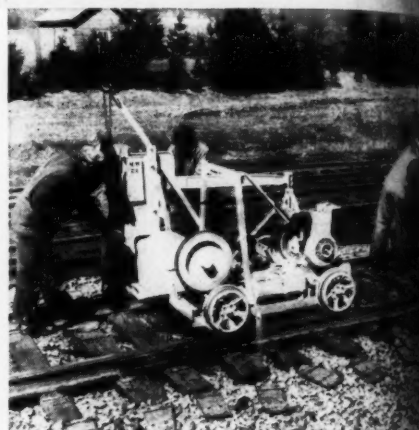
HERE ARE THE  
**NORDBERG**  
*"Mechanical Muscles"*  
 YOU NEED TO DO A BETTER-FASTER  
 MAINTENANCE JOB AT LOWER COST...



**TIE SETTING MACHINE** . . . Provides tie seats in  
 keeping with today's track maintenance standards.  
 It level and in same plane.



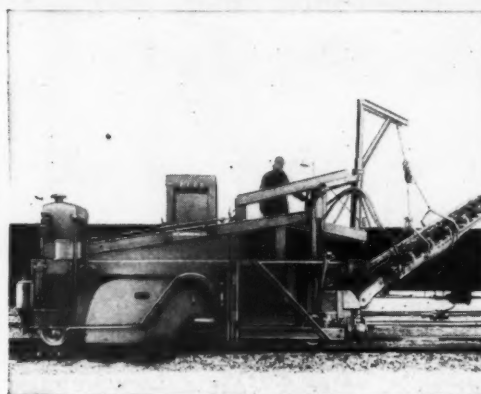
**RAIL DRILL** . . . A compact, lightweight, low-cost  
 easily set drill that proves a money saver.



**SPIKE PULLER** . . . By pulling spikes faster  
 machine speeds up relaying and reduces the  
 of the entire operation.



**ANDY—TIE PULLER and INSERTER** . . . A triple-  
 purpose machine for pulling ties—inserting ties  
 —and as a material handling crane.

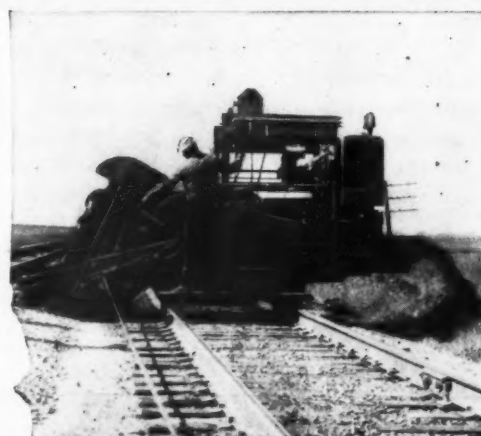


**DSL YARD CLEANER** . . . Cleans more track faster,  
 better, more economically . . . without damaging  
 ties.



**CRIBEX** . . . Removes material contained in  
 cribs and deposits it beyond the ends of the tie.

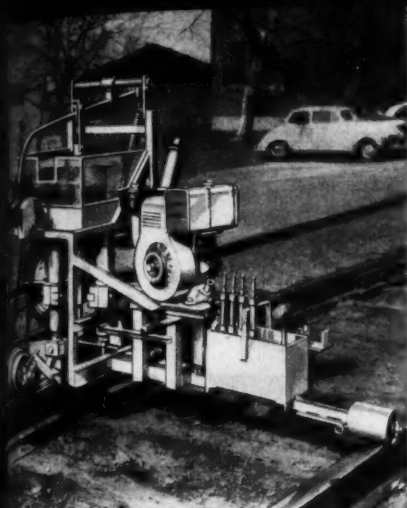
...and be sure  
 to see **ALL** the  
**NEW NORDBERG**  
**MAINTENANCE**  
**MACHINES**  
 at the Chicago Coliseum  
 September 14-17



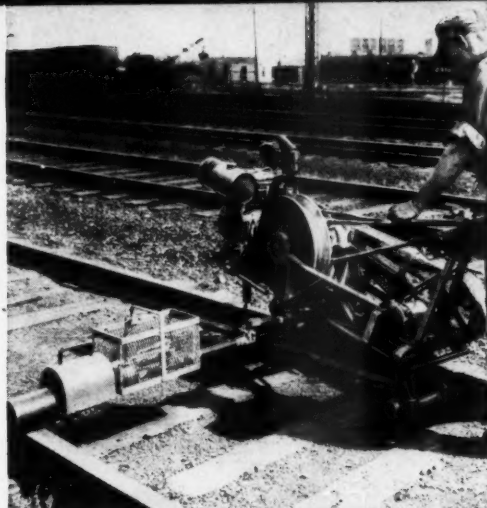
**BALLASTEX** . . . Excavates the ballast in area  
 between tracks or in shoulder. Disposes of it by  
 wasting or by feeding to SCREENEX for cleaning.



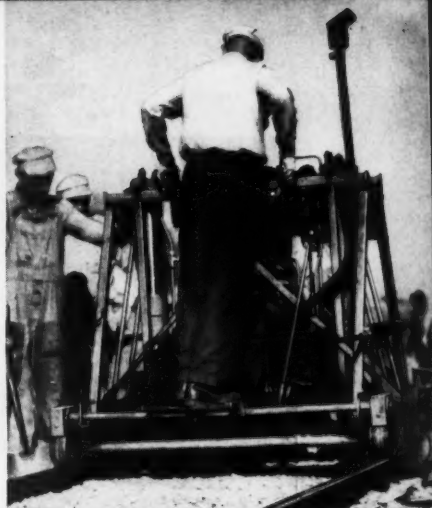
**SCREENEX** . . . Takes excavated fouled  
 fed by BALLASTEX, cleans material and returns  
 to track, intertrack, or shoulder.



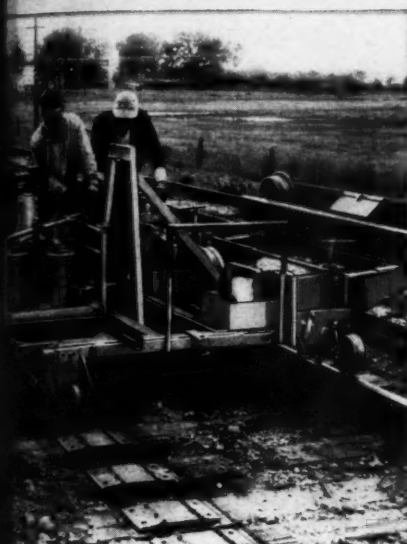
**TIE DRILL . . .** Saves time and money by drilling two holes at once.



**POWER WRENCH . . .** Provides uniformly controlled tightening on track bolts to prolong rail life and make better riding track.



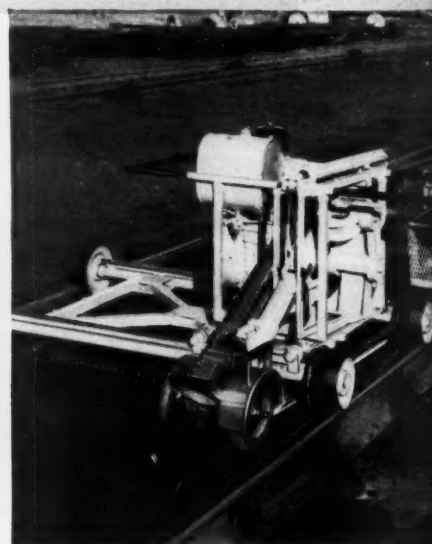
**POWER JACK . . .** Maintains alignment while speeding up ballasting and general surfacing operations.



**SUN-RITE GAGING MACHINE . . .** for extremely accurate gaging by correctly positioning the tie plates.



**SPIKE HAMMER . . .** All spikes driven straight with big savings in time and money.



**RAIL GRINDERS . . .** With four types of grinders Nordberg can supply the machine best suited to any type of maintenance grinding.



**N**ORDBERG, for more than a quarter century, has been the leading manufacturer of dependable track maintenance machinery. Designed, built, and proved in use with the cooperation of track maintenance men . . . this equipment has actually revolutionized maintenance methods in scores of operations once done by hand. Most important, experience has proved that these maintenance operations can be done *better, faster* and at *lower cost* . . . through the use of Nordberg "Mechanical Muscles"<sup>TM</sup>.

It will pay you to inspect the full line of modern, money-saving Nordberg track maintenance machinery that will be on display at the 1953 exhibit in the Chicago Coliseum, September 14-17 . . . where you will see new and improved Nordberg machines for meeting today's maintenance needs.

For further details on any or all of these Nordberg machines, write for literature.

\*COPYRIGHT, NORDBERG MFG. CO.

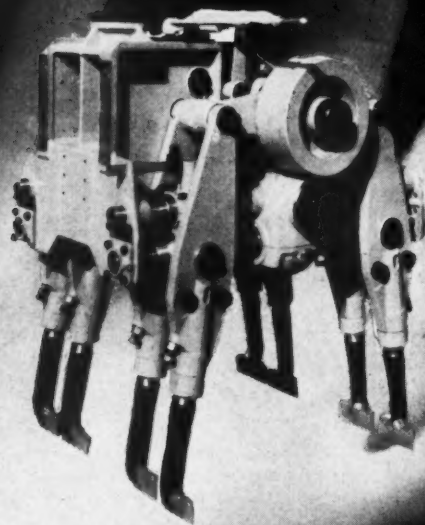
**NORDBERG MFG. CO.**  
MILWAUKEE WISCONSIN



R653

# Matisa

ADDS A VELVET GLOVE TO THE IRON HAND



## NOW, FINGER-TIP TAMPING CONTROL!

- Improved Clutch Requires Less Pressure—Reduces Wear, Reduces Operating Fatigue
- Direct Gear Drive—More Efficient—Less Operating and Maintenance Cost
- *Faster Than Ever!* Quicker, Smoother Tamping Tool Opening Cuts Idle Time, Speeds the Job!

What ELSE is new at MATISA? New Power Wrench • New Tie Adzer • New Tie-Remover and Inserter • New Jack Carrier and the NEW MATISA BALLAST CLEANER! ALL Matisa-designed for "the new Standard in track maintenance!"

TRACKWORK SPECIALISTS ALL OVER THE WORLD



THE MATISA EQUIPMENT CORPORATION • 224 S. MICHIGAN BLVD. • CHICAGO 4

SEE OUR EXHIBIT BOOTHS 42N - 43N - 44N • CHICAGO



# NEWS NOTES...

SEPTEMBER 1953

## ...a resumé of current events throughout the railroad world

Railroad purchases of materials, supplies and fuel in the January-May period this year, plus the estimated value of equipment orders, totaled \$1,029,900,000, slightly below last year's figure for the comparable period. Purchases of rail, amounting to \$47,311,000, were up from \$37,241,000 for the same period last year, but crosstie purchases totaled \$39,830,000 compared with \$45,455,000—the amount spent in the same period of 1952.

A national campaign to promote the shipment of loaded highway truck-trailers by railroad flat car "as a means of revitalizing the railroad industry through new and expanded business," has been proposed by the Brotherhood of Railroad Trainmen. The movement of trailers by rail was seen as a "challenge of unprecedented importance" to the railroads by W. P. Kennedy, president of the BRT, in a recent address before the convention of the Brotherhood of Locomotive Firemen and Enginemen.

The practice of shipping loaded highway trailers on flat cars is rapidly gaining momentum. Several railroads are now offering this type of service, and a number of manufacturers are engaged in developing special equipment for it. General Motors is conducting tests with a new experimental car and tie-down equipment, and is working with the Rail-Trailer Company on the general problem. Pullman-Standard is making plans to test its own "piggy-back" tie-down equipment on a conventional flat car, and manufacturers of fork-lift trucks are racing to perfect special vehicles for side-loading highway trailers on flat cars.

The Railway Express Agency has been authorized by the Interstate Commerce Commission to increase its rates and charges by an average of 15 per cent. It is estimated, assuming no loss of traffic, that the increases will yield added revenue of approximately \$55 million annually.

Seventy-three major railroads and their subsidiaries joined the Railway Express Agency recently in asking the Interstate Commerce Commission to approve a new "standard express operations agreement." The present contract with the REA expires February 28, 1954. The new contract would, in effect, continue the present type and scope of national express service.

The Board of Directors of the Association of American Railroads has decided to establish a new unit "to carry on continuous study and research for improvement of less-than-carload freight service." The new unit will be set up within the AAR's Freight Station Section. A special committee of railroad men had recommended that the new unit be established to carry on the study.

## NEWS NOTES (continued)

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Two-way commercial telephone service has been made available to passengers aboard the Southern Pacific's "Cascade" between San Francisco and Portland. Train 'phone booths have been installed in the dining cars of the trains. The 'phones are coin operated, and calls are handled through radio stations of the telephone company.

•

The world's first use of microwave transmission for remotely controlling power switches and signals in a centralized traffic control system, is now being installed on a 90-mile railroad under construction to haul iron ore from the United States Steel Corporation's new Cerro Bolivar mine in Venezuela to the harbor of Puerto Ordaz. The project combines Union Switch & Signal's centralized traffic control and coded (voice-frequency) control systems, with transmitters and receivers developed by the Radio Corporation of America.

•

All facilities of the Inland Waterways Corporation have been sold by the government to a subsidiary of the St. Louis Shipbuilding & Steel Co. for \$9 million. The sale was announced by Secretary of Commerce Sinclair Weeks. The IWC, operating as the Federal Barge Lines, has been in the transportation business since World War I.

•

With full dieselization of the railroads drawing nearer, the Electro-Motive Division of General Motors Corporation was planning to reduce its output of diesel locomotives from 7 1/2 to 4 units daily. Other builders are also trimming production. The other side of the picture is that substantial orders are still being placed. The Pennsylvania, for example, recently ordered 78 diesel units from four builders at an estimated cost of \$13 million.

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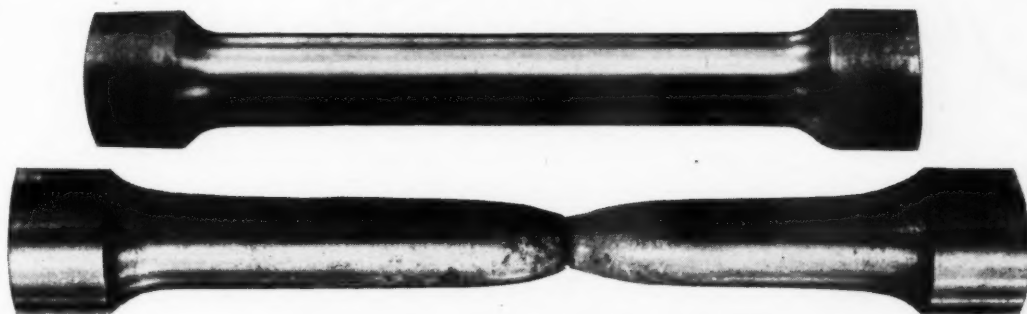
Howard G. Freas and Owen F. Clarke have both been confirmed as members of the Interstate Commerce Commission by the Senate. Mr. Freas succeeds Commissioner William E. Lee, whose term expired last December 31. Mr. Clarke replaces Commissioner William J. Patterson, who has retired. The appointment of another new commissioner—Kenneth H. Tuggle—was confirmed by the Senate on July 31. Mr. Tuggle will fill the vacancy created by the retirement of Commissioner Walter M. W. Splawn.

•

ALSO WORTH NOTING—The Interstate Commerce Commission has announced it will hold hearings on the recent railroad petition for increased mail pay. No date has been set for the hearings . . . There has been too much concern about the size of our freight-car fleet and not enough about the need for new types of freight cars and improvements to existing cars, declared E. G. Plowman, vice-president and general traffic manager of the U. S. Steel Corporation, in a recent address . . . Raymond J. Kelly, an attorney from Detroit, Mich., has been nominated to the Railroad Retirement Board to succeed William J. Kennedy, resigned . . . H. E. Gilbert, vice-president of the Brotherhood of Locomotive Enginemen and Firemen, has been elected president to succeed David R. Robertson.

# SW-65

Bar No. 4512-1  
 1/4" electrode  
 on D.C. Reverse  
 as Welded



Yield Point, 65,700 psi.

Tensile Strength, 75,000 psi.

% Elongation, 30.0

% Reduction Area, 65.6

## Outstanding physicals recommend the A. O. Smith SW-65 low-hydrogen electrode

Here is a picture of an all weld metal .505 of the A. O. Smith SW-65 low-hydrogen electrode. Remarkable strength, superior ductility and exceptional elongation put this electrode in a class by itself.

Nominally an E6016 electrode, it far exceeds A.W.S. specifications for this class. It is used in many applications as an E7016 because of its superior physicals.

Its better manipulation, lack of spatter, easy re-strike, quick cleaning slag and fine appearing bead make it an operator's favorite from the very first trial.

With SW-65, you have the exceptional electrode for welding cold-rolled steel, re-rolled rail, high carbon, sulphur, selenium bearing steels and steels of poor weldability.

This is the electrode to use with confidence whenever there is any doubt about weldability, and where you desire high physical and x-ray quality.

May we suggest that you write us or contact your local A. O. Smith distributor for full details and a chance to test this remarkable low-hydrogen electrode.

# A.O. Smith

C O R P O R A T I O N



WELDING PRODUCTS DIVISION, MILWAUKEE 1, WISCONSIN  
 INTERNATIONAL DIVISION: MILWAUKEE 1, WISCONSIN

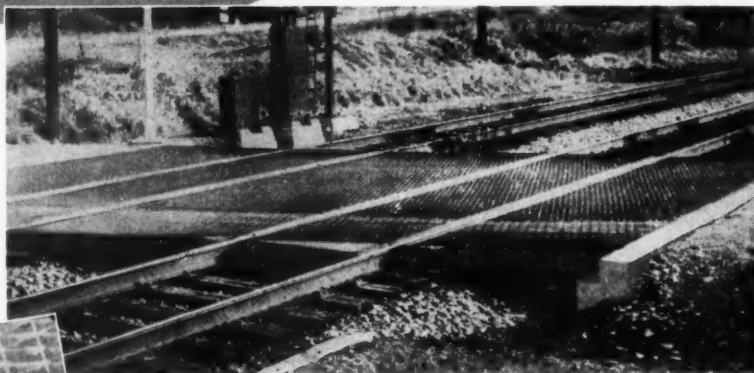
THE ORIGINAL

*Condon*

## Steel Grating Railroad Crossing

**INSTALLED 5 YEARS AGO  
STILL AS GOOD AS NEW!**

- No Wear
- No Deterioration
- No Replacements
- No Maintenance



*Condon* CROSSINGS  
SAVE YOU MONEY!

This original installation—in the main line of the Erie Railroad at Canisteo, N. Y.—has now been in service for five years. It shows no wear or deterioration—has needed no replacements or repair—is still as good as when installed.

- Highly durable, non-skid steel surface
- No heavy equipment necessary for installation—can be handled by 2 men
- Sections can be removed for ballast-cleaning equipment or power tampers
- Sturdy and noiseless—constructed to H 20 Loading
- Fits any rail section
- Drains freely, same as open track
- Easily removable—and transferable
- No snow or ice removal problems
- Curve installations at no extra cost

Showing at CHICAGO  
CONVENTION, September 14-17

See the working model of the CONDON CROSSING at the Morrison Railway Supply Corporation exhibit—Booth #6, TSA Chicago Convention September 14 to 17.

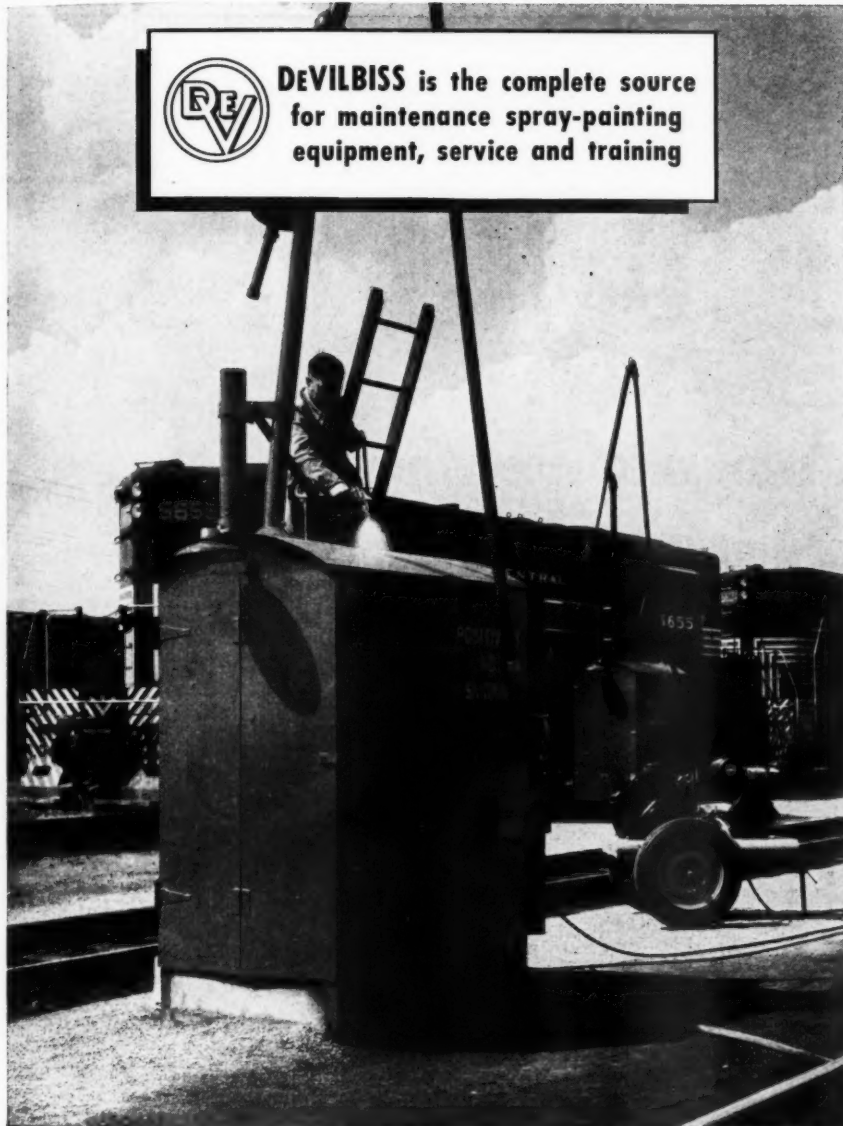
**MORRISON**  
RAILWAY SUPPLY CORP.

Rand Building  
BUFFALO 3, N. Y.  
1831 29th Avenue North  
BIRMINGHAM, ALA.  
332 S. Michigan Blvd.  
CHICAGO 4, ILL.

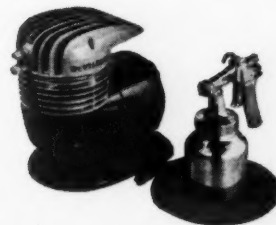




**DEVILBISS is the complete source  
for maintenance spray-painting  
equipment, service and training**



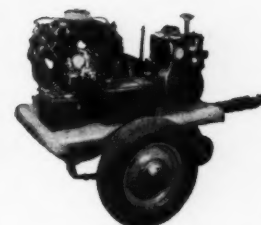
**Spray Guns  
for every use**



**Portable Utility Outfits  
for minor paint jobs**



**One-man Spray Painting Outfits  
for heavy-duty painting**



**Air Compressors,  
Portable and Stationary**

## Paint up to 4 times faster!

In the yards or down the line, you save time, money and effort with DeVilbiss spray equipment!

DeVilbiss spray guns are not only faster, but apply in one coat the equivalent protection of two or more brush coats. They are lightweight and comfortably balanced. They easily apply a uniform, full-covering coat to all surfaces, smooth or rough. Nooks and crannies get the same even coat as flat surfaces.

Gun adjustments are positive and quick; parts are easy to clean. Paint-

ers can switch from spraying a shed to a stenciling job in seconds!

It's easy to find out how your men can get these benefits. All you need do is contact your local DeVilbiss supplier or branch office. You'll find they have a gold mine of information on spray methods, service and training.

With their help, you can integrate spray guns, paint tanks, compressors and other accessories to form an economical, efficient, up-to-the-minute painting program. Why not look into it today!

In the tuition-free DeVilbiss school, we will train your painters and maintenance foremen on all phases of the spray method. Write for application forms and dates of these one-week courses.

**THE DEVILBISS COMPANY, Toledo, Ohio**

Windsor, Ontario • London, England • Santa Clara, Calif.

Branch Offices and Distributors in Principal Cities Throughout the United States, Canada and the World

RAILWAY TRACK and STRUCTURES

For additional information, use postcard, pages 885-886

FOR BETTER SERVICE, BUY

**DEVILBISS**



SEPTEMBER, 1953 817

# BLACRETE

**THE ENDURING ALL-WEATHER  
STOCK PILING HIGH-STABILITY**

**BLACK TOP MIX**

## **USES**

**RAILROAD CROSSINGS  
STATION PLATFORMS  
PARKING AREAS  
ROADS • WALKS • BALLAST**

**AVAILABLE IMMEDIATELY IN RAILROAD CAR  
LOADS OR IN SMALL QUANTITIES FROM PLANTS  
LOCATED IN MIDDLE AND SOUTHWEST**

Write for descriptive pamphlet

**ROCK ROAD CONSTRUCTION CO.**

**5915 ROGERS AVE., CHICAGO, ILL.**

**PHONE SPring 7-8800**

# IT'S MORE THAN THE WORLDS MOST POWERFUL RAIL ANCHOR!

The ADVANCED TYPE  
WOODINGS RAIL ANCHOR  
is self-adjusted to the  
width of the rail base.  
One piece; two equal  
grip jaws, one on each  
side of the rail base.

Wide steel section reduces possi-  
bility of derailed wheels punch-  
ing anchor through rail base. The  
design offers little for dragging  
equipment to come in contact with.

Advanced metallurgy  
makes it the most power-  
ful and gives it the HIGHEST  
REPLACEMENT VALUE OF ANY  
RAIL ANCHOR ON THE MARKET  
—ask your Branch Line  
Supervisor!

*Woodings*  
**FORGE & TOOL CO.**  
CHICAGO

ST. LOUIS



Fast Trestle Construction

Encasement During Operation

Any contractor can do ordinary jobs, but Detzel has the adaptability to handle the unusual problems of railroad work. Trained construction and maintenance crews with "know-how" of railroad problems, and Detzel specialized equipment, provide the necessary techniques to complete your job without undue delay to train service. Keep your trains rolling with Detzel on the job; consult Detzel for these services:

Soil stabilization  
Gunite and Pumpcrete  
Sealing of cofferdams

Pressure Grouting  
Tunnel Maintenance

Under-pinning  
Timber Trestles  
Pile encasement

Restoration of concrete and all masonry surfaces  
Track construction and maintenance

Write for illustrated literature showing the Detzel organization at work.



Pumpcrete Avoids Slow Orders



Gunite Saves Existing Structures



Underpinning without Train Delay

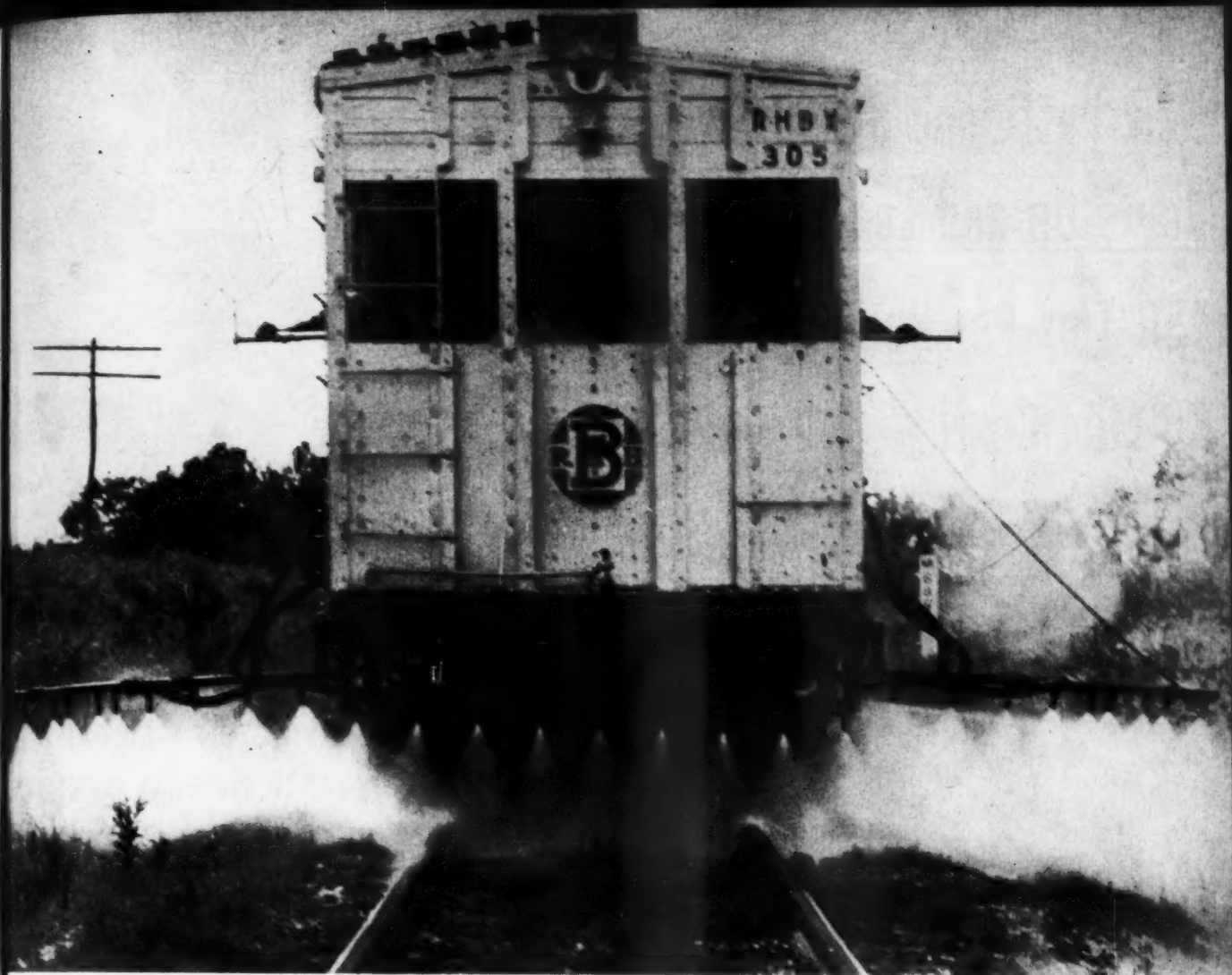


**GEORGE E. DETZEL COMPANY**  
Contractors

2303 GILBERT AVE.

CINCINNATI 6, OHIO





# THE BOGLE WAY IS THE

*Tested Way*

It is a truism that there is no substitute for experience. And, in getting rid of weeds and roadway growth—it applies with particular force. The Bogle way follows a blazed trail of consistent "on track" tests which determine the most economical and effective treatment for the job at hand.

*Research-proved* herbicides are applied with the most modern spraying equipment manned with skilled operators. *The Bogle way* results in the lowest possible cost per mile.

*A cordial welcome awaits you at our exhibit—Booth 10-N.*

**The R. H. BOGLE Company**

ALEXANDRIA, VA.

Memphis, Tenn.

COMPLETE WEED AND BRUSH KILLING SERVICE



# New Pettibone Speed Swing Roots Up and Loads

## 450 Ties Per Hour On 66 Mile C & N W Job



**ROOTS UP**—Here Pettibone Speed Swing digs under embedded ties at start of cycle on C&NW mainline. Hydraulically powered fork roots up and accumulates a full forkload in one forward motion. Trestles offer no obstacle either. Off-track, Pettibone Speed Swing takes all track conditions without slowdowns. Notice large tires for across-track maneuvering.

### ESTIMATED SAVINGS OF \$360 DAILY

#### WITH NEW OFF-TRACK SPEED SWING

The new Pettibone Speed Swing has revolutionized Chicago and North Western's tie removal methods, and additionally handles a variety of other jobs the year around. C&NW saves \$360. a day removing and loading ties alone on a 66 mile mainline conversion of double track to single track operation. Formerly 40 men were required for comparable production, plus laborious crane hoisting to gondolas. One operator and the new Pettibone Speed Swing does it in one cycle.

The new Pettibone Speed Swing is a necessity for every efficiency-minded railroad official. A brief talk with us will bring convincing evidence of many money saving advantages. Telephone or write today.

**SWINGS AND LOADS**—Moving, a simple hydraulic control hoists the load and swings it right or left at 180 degrees, and unloads with a reach that easily discharges gondolas and trucks. No gee hawing. No maneuvering. Pettibone Speed Swing stays put for a direct forward motion into the next ties. C&NW's 450 ties per hour time and money-saving experience can be yours, too, with the new Pettibone Speed Swing.

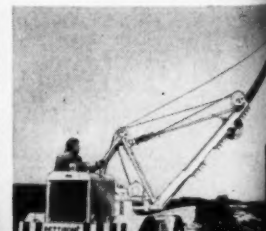


**ALL YEAR USAGE**—With BUCKET attachment, C&NW fills shoulders, levels roadbed as the tie removal job progresses. There are many mainline and yard loading jobs for Pettibone Speed Swing with  $\frac{3}{4}$  or 1 cu. yd. BUCKET. Other attachments illustrated are TOTE CRANE and 2 or 4 cu. yd. SNOW BUCKET. Note also at lower right another Pettibone efficiency machine—the SPEED SWING YARD CRANE with 7500 lbs. lifting capacity.

**PETTIBONE** MULLIKEN CORP.

# SPEED SWING

4700 West Division Street • Chicago 51, Illinois • SPaulding 2-9300



# A SHOW TOO GOOD TO MISS!

STARRING

TRACK  
SUPPLY

BRIDGE AND  
BUILDING  
SUPPLY

**THE 1953 JOINT EXHIBITION  
SEPTEMBER 14-15-16-17, CHICAGO  
DURING ROADMASTERS' AND  
BRIDGE AND BUILDING CONVEN-  
TIONS SEPTEMBER 15-16-17  
CONVENTION HEADQUARTERS:  
CONRAD HILTON HOTEL...  
EXHIBIT HEADQUARTERS:  
THE COLISEUM...**

*You and your staff shouldn't be any place but  
Chicago Sept. 14-17. Everyone else will be there!*

New ideas, new plans, new designs will be discussed in the meetings — and NEW PRODUCTS, NEW TECHNIQUES, NEW DESIGN AND CONSTRUCTION CAN BE SEEN IN PERSON AT THE MAMMOTH EXHIBIT AT THE COLISEUM!

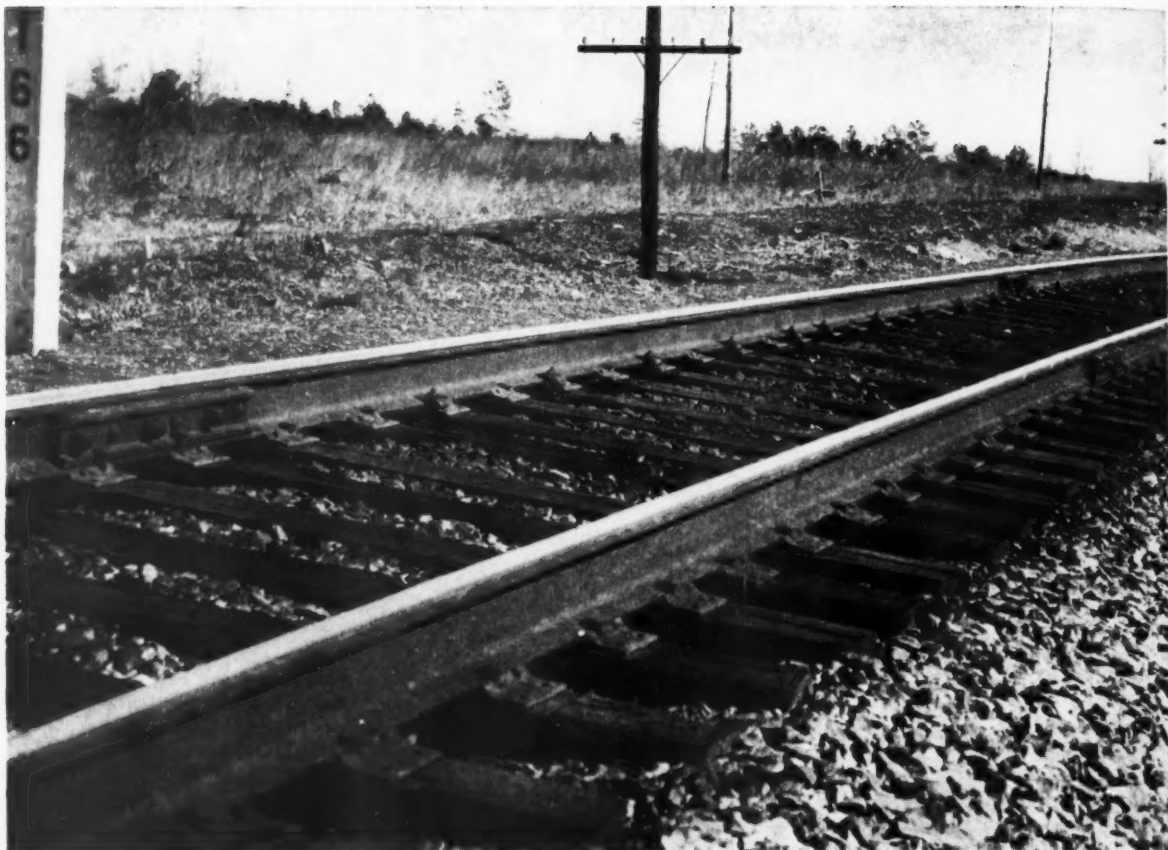
A lot has happened since 1950 — and a lot will happen

before the next show in 1955! This will be the biggest show of its kind ever held, it's too good — too important to miss! Circle the dates — September 14-17 inclusive — and plan NOW so that you and your staff won't miss this important convention and exhibit!

For information,  
write:

**TRACK SUPPLY ASSN. • BRIDGE AND BUILDING SUPPLY ASSN**





## COMPRESSION ANCHORS Offer Better Protection Against Tie Wear

### Let's Get Down to "Brass Tacks"

This is another in a series of factual, down-to-earth advertisements on rail anchors. Some of these are little known facts; others will bear repeating. They all add up to this: that year in and year out—COMPRESSION ANCHORS are a *better* buy!

### *Here's Why...*

The spring action of Compression Rail Anchors cushions the terrific impact of high speeds and heavy wheel loads typical of today's railroading. And they take these stresses in stride in *either direction*. As a result, tie spacing is *held*—providing 100% protection against slewed ties. Tie rocking is eliminated and a better track structure is obtained throughout.

## THE RAILS COMPANY

General Office

178 GOFFE STREET, NEW HAVEN 11, CONN.

ST. LOUIS, MO.

HOBOKEN, N. J.

CHICAGO, ILL.



Now . . . For Fast, Easy, Economical

# WEED CONTROL in

Yards  
Short-Lines  
Terminals  
Sidings  
Bridges, etc.

## Use GENERAL CHEMICAL STA-KLOR\* SPRAY POWDER

Special High Strength  
TCA-CHLORATE Formulation  
in easy-to-use soluble powder form

At last . . . here is an effective, economical, easy-to-use spray powder for general weed control maintenance work by untrained help. It's General Chemical's STA-KLOR.

With STA-KLOR, railroad maintenance men have a versatile all-purpose weed killer that can be applied by their regular labor crews anywhere weeds are a problem . . . in yards, terminals, short-lines, sidings, around bridges, etc. Since STA-KLOR is a non-selective weed killer, you can get thorough kill of both broad-leaved and grassy weeds as well as other undesirable vegetation above the ground. In addition, STA-KLOR gives maximum root eradication and suppression of seed germination thus reducing regrowth.

STA-KLOR is a special high strength formulation of sodium trichloroacetate and sodium chlorate in soluble powder form. The combination of these two powerful herbicides is now widely recognized as the outstanding multi-purpose weed control material. STA-KLOR is an easy-to-use powder version of General Chemical's famous "Rite-o-way"\* Brand TCA-CHLORATE, which has given such outstanding results this year on leading railroads throughout the country.

\*General Chemical trade-mark



Weed Killer Department  
GENERAL CHEMICAL DIVISION  
ALLIED CHEMICAL & DYE CORPORATION  
40 Rector Street, New York 6, N. Y.

### SAFE, EASY TO HANDLE, EASY TO USE!

General Chemical STA-KLOR can be stored and handled with the utmost ease and simplicity, and greatly reduces fire risks. It can be applied as a spray or as a dust, depending upon the user's preference and the terrain and type of weed growth to be controlled. For dust applications, simple sifters or dusters are suitable. For spraying, STA-KLOR dissolves readily in hard or soft waters.

### ECONOMICAL TOO!

Being a highly concentrated, high-strength formulation, STA-KLOR gives good control at low dosages, making it an economical, low-cost control material suitable for maintenance programs and other uses where cost is a factor. For example, 160 pounds of STA-KLOR will effectively treat one acre of land!

### WRITE TODAY FOR FURTHER INFORMATION

Investigate the advantages General Chemical STA-KLOR offers for your weed control program. Send coupon today. No obligation, of course.

General Chemical STA-KLOR gives you these big advantages:

- Economical.
- Easy to handle . . . easy to use.
- Gets both broad-leaved and grassy weeds.
- Kills roots, prevents regrowth.
- Does not create fire hazard . . . retards burning.

Clip this coupon to your business letterhead and mail today!

Weed Killer Department,  
General Chemical Division, Allied Chemical & Dye Corporation  
40 Rector Street, New York 6, N. Y.

Please send me further information and prices on STA-KLOR.

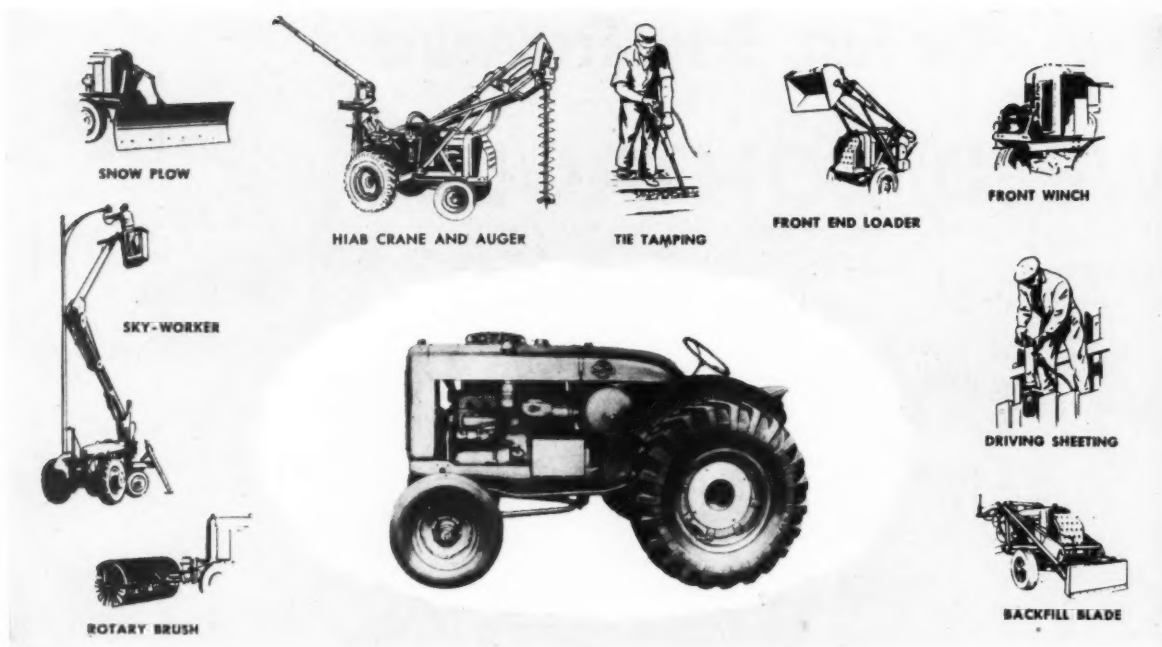
I plan to use STA-KLOR for: \_\_\_\_\_

Name \_\_\_\_\_ Title \_\_\_\_\_

Railroad \_\_\_\_\_

Address \_\_\_\_\_ RT-9





## Your *Pneumatractor* Air Compressor-BASIC UNIT of many cost-saving machines

Start with this 105-foot compressor-tractor that feeds up to eight tie tampers or spike drivers. Its easy off-track mobility fits it for other air jobs too—sheet pile driving, rock drilling and spray painting, to name only a few. And, of course, it's a tractor that will "get its back into" any pushing or hauling job.

Even if you stopped there, you would be getting big value for your investment, but suppose you occasionally need a small snow plow for yard or station areas? Buy a special machine? Not if you already own a Pneumatractor! Simply hook on a Schramm snow plow attachment and you're all set. There are several other useful auxiliary attachments available, such as the ingenious Sky-Worker that gives a workman a safe, adjustable platform for those high jobs. No wonder one large railroad, starting a few years ago with one versatile Pneumatractor, now owns 76!

Get all the details about the cost-saving Pneumatractor and its many attachments by writing today for Bulletin NEU 53, Schramm, Inc., West Chester, Pennsylvania.

See Schramm compressors and air tools at Booth 7, Track Supply Ass'n. Exhibit, Coliseum, Chicago, September 14-17.

### Yours for the asking HANDY AIR TOOL CALCULATOR

One side of this plastic pocket-size calculator shows you how many air tools of any kind—tampers, drivers, breakers, etc.—can be efficiently operated by any capacity compressor. Other side gives consumption of various air shop tools and formula for figuring correct compressor capacity to take care of them. Information good for any make compressor. When writing for one, ask for Schramm's Catalog 5350, describing the complete line of Schramm air tools ranging from tampers and breakers to impact wrenches and chain saws.

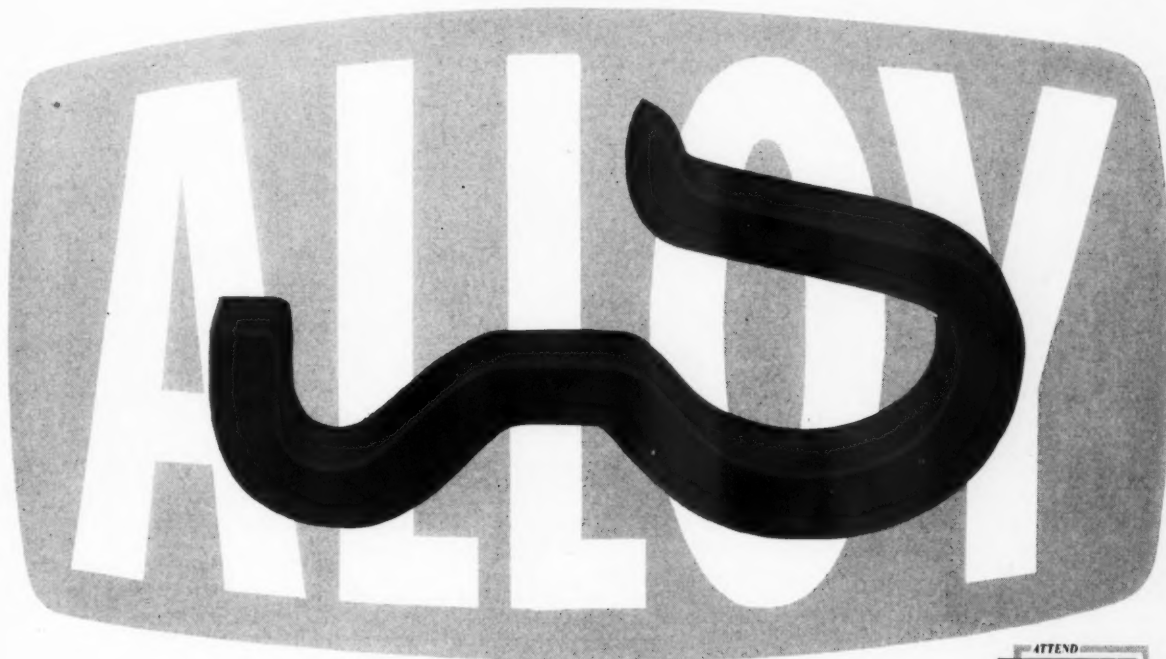


# SCHRAMM AIR COMPRESSORS

A SIZE AND MODEL FOR EVERY AIR NEED

20-35 60 105 210 315 600

The **IMPROVED GAUTIER**  
**RAIL ANCHOR**  
 is made of



**SPRING STEEL**



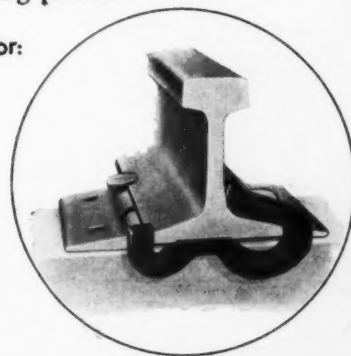
Because it makes a better rail anchor. It adds to its durability, reduces its cost of maintenance, lengthens its life, and adds to its holding power.

Other outstanding features of the Improved Gautier Rail Anchor:

*It can't be overdriven.*

It is easily and quickly installed or removed with maul or spike maul.

It is equally suitable for new or old rail because of its substantial take-up.



*Manufactured and Sold exclusively by*

**MID-WEST FORGING & MANUFACTURING COMPANY**

General Office, 38 South Dearborn Street, Chicago 3, Illinois • Manufacturing Plant, Chicago Heights, Illinois

# PRESENTING...



1. Kershaw Ballast Regulator, Scarifier and Plow



2. Kershaw "Wheel Type" Kribber.



3. Kershaw Utility Derrick



4. Kershaw Pneumatic Tie Nipper



5. Kershaw Mocar Crane

## TO CUT TRACKWORK COSTS

Any of the five KERSHAW trackwork machines shown above will pay for itself in the first year of operation or after 15 or 20 miles of trackwork. After that, the savings to you are "velvet."

The new streamlined KERSHAW BALLAST REGULATOR, KERSHAW "WHEEL TYPE" KRIBBER and KERSHAW UTILITY DERRICK will be on display at our booths 23S-28S at the joint exhibition of the Track Supply Association and Bridge and Builders' Association at the Coliseum in Chicago Sept. 14-17. We cordially invite you to stop by and inspect them for yourself.

### HERE ARE SOME PROVEN FIGURES

Item	Machine	Operation	Savings
1.	Kershaw Ballast Regulator, Scarifier and Plow	(a) Regulate, distribute and shape ballast in surfacing gangs. (b) Scarifying, de-weeding, plowing and maintaining ballast shoulder.	\$600.00 to \$1,000.00 per mile.  \$300.00 to \$400.00 per mile.
2.	Wheel Type Kribber	(a) Cribbing ahead adzers in relaying gangs. (b) Skeletonizing.	\$150.00 to \$200.00 per mile. \$300.00 to \$350.00.
3.	Utility Derrick	Setting off relaying equipment.	5 minutes each closure.
4.	Pneumatic Tie Nipper	Nipping ties.	2 men.
5.	Mocar Crane	Setting up rail in relaying operations.	\$10,000.00 on capital investment.

**KERSHAW MANUFACTURING CO., INC.**  
TRACKWORK EQUIPMENT DESIGNED,



# AND NOW, THREE\* MORE KERSHAW TRACKWORK MACHINES

*Developed and  
Designed to  
Save You  
Money*

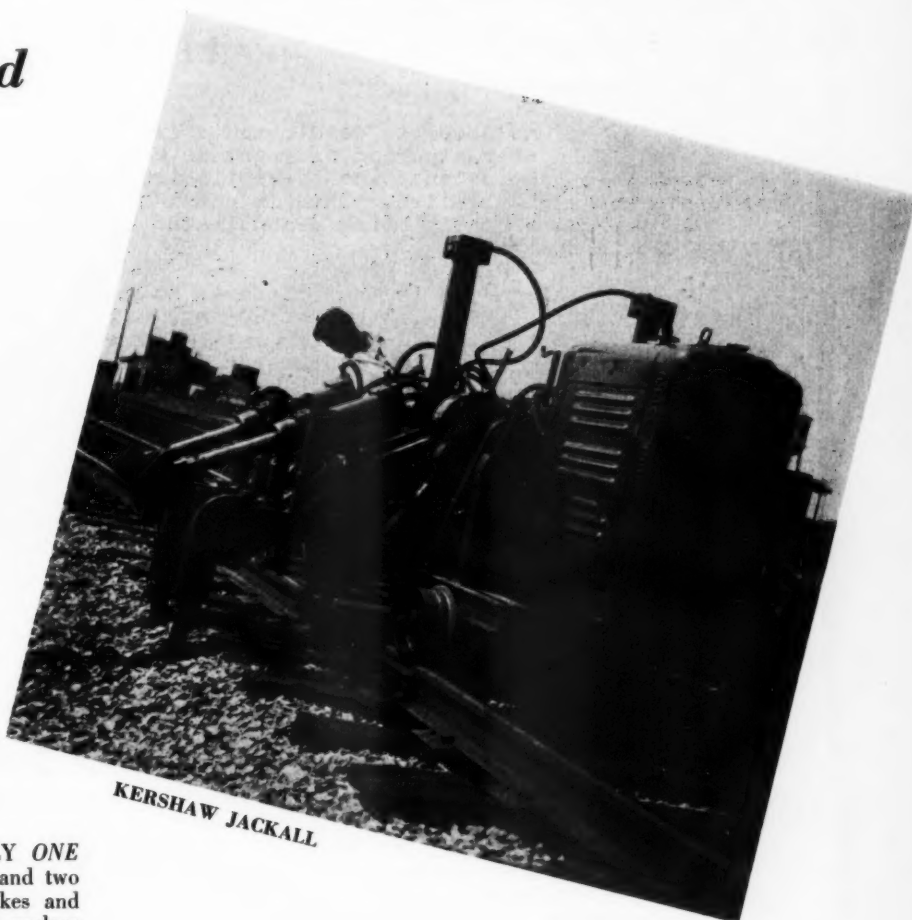


VISIT OUR BOOTHS  
23S-28S

\*The KERSHAW TIE PULLER AND INSERTER, recently perfected by our engineers, will be on display for the first time at our booths 23S-28S in Chicago Sept. 14-17.

This machine is used to remove old ties and insert new ties in retimbering tracks. IT WILL PULL THE OLD TIE AND INSERT THE NEW TIE IN ONLY ONE MINUTE. Operated by one man and two helpers and ten men pulling spikes and driving spikes. The machine will replace ties, maintaining the original surface at the rate of 20 to 30 ties per man-day.

\*Another brand-new KERSHAW machine to be on display is the KERSHAW HYDRAULIC JACK which is a one-man operation, self-propelled and provided with automatic rail dogs. See them for yourself at booths 23S-28S in Chicago.



KERSHAW JACKALL

The KERSHAW "JACKALL" (combination Hydraulic Jack and tamper) above, is the newest model in this line of KERSHAW machinery. This machine does the work of 12 to 14 jack men normally used in your surfacing gangs.

Using the JACKALL with any multiple tamper, it is now possible to surface track with a gang of 10 men or at the rate of 250 to 300 feet per man-day.

## P. O. BOX 510, MONTGOMERY, ALA.

**DEVELOPED AND PROVEN ON THE JOB**

No. 297 of a series

RAILWAY

# TRACK *and* STRUCTURES

SIMMONS-BOARDMAN PUBLISHING CORPORATION

79 WEST MONROE STREET  
CHICAGO 3, ILL.

September 1, 1953

Subject: The Sky's the Limit

Dear Readers:

Anyone who observes developments in the railway maintenance-of-way field over a period of years is certain ultimately to reach this conclusion: The possibilities for progress and improvement are unlimited. This is not a statement of an abstract theory. Its truth is being demonstrated almost every day by actual developments.

What this means is that there is no product or practice now used in your field which cannot be improved, or improved upon, in some way. The rate of progress may sometimes seem to be slow, but it is inexorable. How often has it happened that a device or machine, long considered the last word in efficiency or effectiveness, has suddenly been rendered obsolete by the introduction of a better product? Such developments are producing constant changes in the ways we do things. Can you think of any maintenance task that isn't done better and more efficiently now than it was 10 years ago? We doubt it.

This evolution toward a better state of things is evident throughout our culture. Even in sports we find that all-time new records are frequently being established, which makes us wonder sometimes what the record for the mile will be 50 or 100 years from now. This constant striving toward new goals results from the presence of a dynamic force. Among some peoples, the Australian bushmen, for example, this force does not seem to be present at all. The Americans seem to be at the other extreme. Nowhere else in the world do the forces for social and technological betterment function with such vigor as they do in our country.

We don't pretend to be able to explain this situation. That is for the economists and the psychologists. All we know is that progress goes on, and that what is considered impossible today becomes commonplace tomorrow. That is why anyone who says "it can't be done" is going to have to eat his words sooner or later. For instance, those who said 10 or 20 years ago that tie renewals couldn't be mechanized are now faced with the necessity of digesting their rash statements.

What else seems impossible in the maintenance-of-way field today? Draw up your own list and then see 10 years from now on how many points you were wrong. I am sure you will find the results interesting.

Yours sincerely,

*Merwin H. Dick*

Editor

MHD:lw

Members: Audit Bureau of Circulations and Associated Business Publications

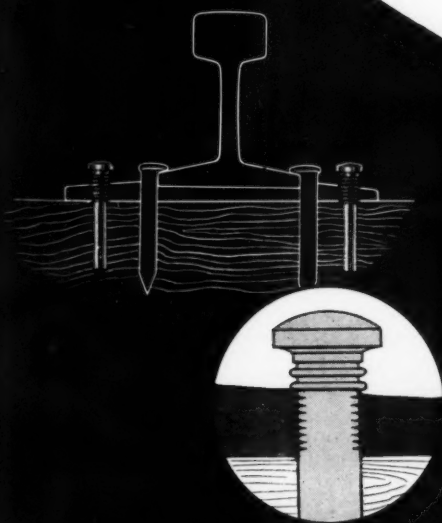
# THE RACOR STUD

## IN EXTENDING TIE LIFE

- IT REDUCES TIE ABRASION
- IT REDUCES SPIKE KILLED TIES
- IT REDUCES SPLIT TIES

## IN PROVIDING STURDIER TRACK

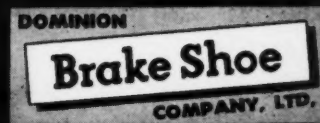
- IT MAINTAINS BETTER LINE AND GAGE
- IT DEFERS TIE REPLACEMENT
- IT REDUCES LABOR COSTS



**RAMAPO AJAX DIVISION**

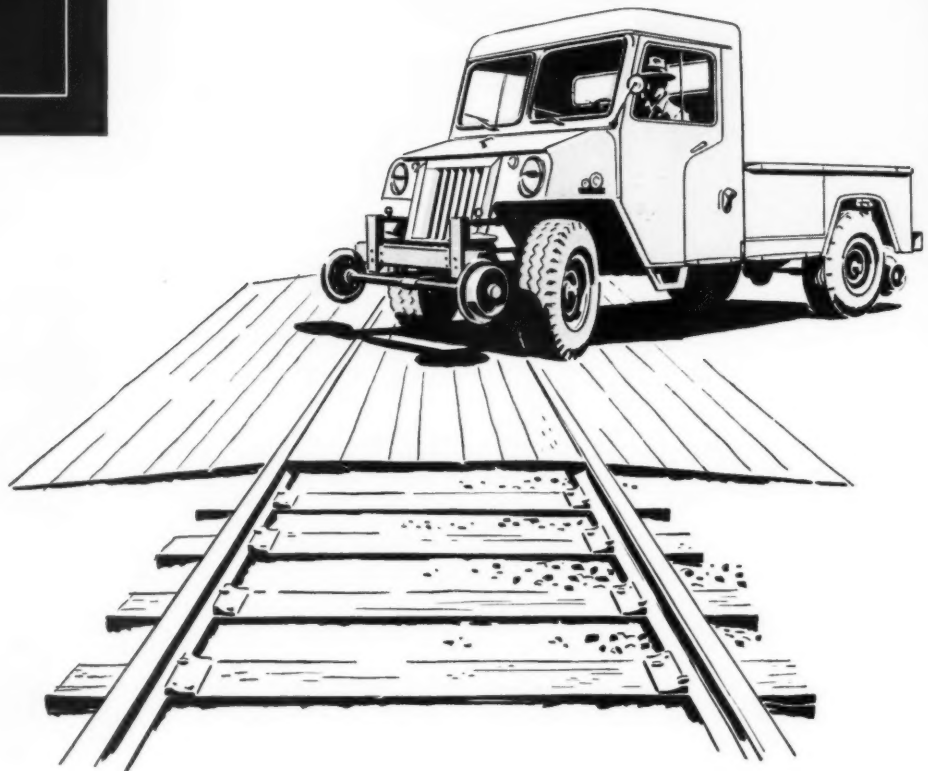
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inating costly and time-consuming change-overs of men and material. When on the road, the car travels as an ordinary highway vehicle—and when on the track, guide wheels position the car while the pneumatic tires carry the load. The latest version of the Fairmont Hy-Rail car is the A32 Series A, illustrated above. It features a rugged, dependable engine, a four-wheel drive, four-wheel braking, a fully enclosed cab and a "T" shaped pick-up box. Although only recently put into service, the A32 Series A Hy-Rail car has already established itself as an asset to any maintenance operation. It is proof that Fairmont progress spells real results in better railroading everywhere.

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RAILWAY

# TRACK and STRUCTURES

TRADEMARK

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## *ARMCO BUILDINGS*

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*business suits*

*or*

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*Armco  
Steel  
Buildings*



## How Far Should "Service" Go?

In general, manufacturers of railway machines grant a liberal warranty period in which defective parts will be replaced free of charge. Also, if it happens to be a new type of machine, the supplier will send out a service man to instruct the railroad operator on the proper handling of the unit. This is mutually beneficial to both the railroads and the suppliers; the railroad has the assurance that its new machine will produce the results for which it is intended, and the supplier is assured that his machine will not create an unfavorable impression by breaking down through misuse.

A warranty is a form of surety to the purchaser that the manufacturer has used sound materials and good workmanship in the product, and is a promise to repair or replace any part that might fail through normal use. Logically, the warranty cannot go on forever, so the manufacturer sets a time limit for which he will guarantee useful service for his unit.

However, there are some railroad men who do not understand this, or, if they do, they may deliberately ignore the time limit of the warranty. If a machine breaks down, it can be expected that the manufacturer, who is anxious to please his customers, will dispatch a representative as quickly as possible in response to a telephoned or telegraphed request. When repairs have been made and if the warranty time limit has expired, the railroad supervisor should expect to be presented with a bill covering at least the parts and labor incurred in making the repairs. In fact, in all fairness, the supervisor should ask for such a bill.

Automobile manufacturers grant a warranty period of 90 days on their products, and after that the owner of the vehicle goes to a garage and pays for any repairs required. Should railroad equipment manufacturers be expected to keep their machines in repair indefinitely without cost to the owners?

## The Problem of Rail-End Batter

Rail-end batter and the wear of frogs and switches under traffic present a continuing problem for the railroads. Practically all roads follow the practice of building up battered rail ends and worn frogs and switches, and many of them seem to be satisfied with the results being obtained.

Even so, there are reasons for believing that perhaps present practices leave something to be desired. For one thing, it is observed that the methods in use vary widely between different railroads. Such variations have to do with the amount of batter that is allowed before repairs are made, the type of welds used, the kind of welding rods employed, and the procedure for making the welds. These variations suggest that perhaps this phase of the art of repair welding is still in a state of flux.

Another indication of some degree of dissatisfaction with the results being obtained with present methods is the fact that a number of railroads are continuing to conduct experi-

ments in an effort to develop more economical and effective practices. These endeavors deserve commendation, but there are reasons for questioning whether they can be expected to be highly productive.

In view of the situation pictured above it is interesting to note that plans are afoot for a scientific attack on the problem by the research staff of the Engineering Division, AAR. These include a budget request for funds to undertake a study of the causes and remedies of rail-end batter, and another budget request for the funds required to continue, on an enlarged scale, an investigation started this year of methods of heat-treating and repairing carbon steel frogs and switches.

It is heartening that research projects along these lines have finally been started. They conceivably will produce findings that will enable the railroads to effect substantial economies in the cost of repairing rail ends, frogs and switches.

# PROGRAMS

## Concurrent Annual Conventions of the Roadmasters' and Maintenance of Way Association and the

## American Railway Bridge & Building Association

Conrad Hilton Hotel, Chicago, September 15-17, 1953

(All Sessions Chicago Daylight Saving Time)

### JOINT SESSION

(North Ballroom)

Tuesday, September 15

- 10:00 a.m.—Joint conventions called to order.  
Invocation.  
Welcome by presidents of the Roadmasters' and B. & B. Associations.  
Greetings from the American Railway Engineering Association.  
Greetings from the Track Supply Association.  
Greetings from the Bridge & Building Supply Association.  
10:30 a.m.—Address by R. G. May, vice-president, Operations and Maintenance department, Association of American Railroads.  
11:15 a.m.—Address on What Management Expects of the Supervisor and Vice Versa by H. J. McKenzie, president, St. Louis Southwestern, St. Louis, Mo.  
12:00 noon—Joint Announcements.  
12:05 p.m.—Adjournment for lunch.

### TUESDAY AFTERNOON

#### ROADMASTERS' SESSIONS

(North Ballroom)

- 2:00 p.m.—Address by President R. H. Gilkey.  
2:15 p.m.—Recognition of Past Presidents.  
2:30 p.m.—Report of Committee on Standard Practice in Use of Large On-Track Tamping Machines—E. M. Cheatham, chairman (roadmaster, St. Louis-San Francisco, Sapulpa, Okla.).  
3:15 p.m.—Report of Committee on Roadbed Stabilization—W. W. Hay, chairman (associate professor of railway civil engineering, University of Illinois, Urbana, Ill.).  
4:15 p.m.—Adjournment.

#### BRIDGE & BUILDING SESSIONS

(South Ballroom)

- 2:00 p.m.—Address by President Foster R. Spofford.  
2:15 p.m.—Recognition of Past Presidents.  
2:30 p.m.—Report of Committee on Selection and Training of B&B Department Personnel—J. M. W. Norris, chairman (supervisor bridges & buildings, Delaware & Hudson, Oneonta, N. Y.).  
3:00 p.m.—Report of Committee on Ventilation and Air Conditioning of Railway Buildings—W. H. Bunge, chairman (assistant engineer, Missouri Pacific Lines, Houston, Tex.).  
3:45 p.m.—Color moving picture showing progress to date of tests conducted by Atchison, Topeka & Santa Fe in effort to find suitable means of fire-proofing treated timber trestles. Shows burning of full-scale models. Commentary by C. H. Sandberg, assistant bridge engineer, Santa Fe System.  
4:15 p.m.—Adjournment.

### WEDNESDAY MORNING

September 16

- 9:30 a.m.—Report of Committee on Various Methods and Practices of Joint and Rail-End Maintenance—F. J. Neely, chairman (roadmaster, Texas & New Orleans, Houston, Tex.).  
10:15 a.m.—Address on What About the Section Foreman Problem? by W. M. S. Dunn, general roadmaster, New York, Chicago & St. Louis, Bellevue, Ohio.  
11:00 a.m.—Report of Committee on Maintenance of Branch Lines and other Light Traffic Lines—K. E. Henderson, chairman (trainmaster, Alabama, Tennessee & Northern, York, Ala.).  
12:00 noon—Adjournment for lunch.  
9:30 a.m.—Report of Committee on Application of Modern Machines and Power Tools to Bridge Maintenance—J. M. Lowery, chairman (assistant chief engineer, St. Louis Southwestern, Tyler, Tex.).  
10:15 a.m.—Report of Committee on Programming Repairs and Replacements—J. J. Healy, chairman (supervisor bridges and buildings, Boston & Maine, Boston, Mass.).  
11:00 a.m.—Report of Committee on Rejuvenation of Safety Meetings—Marshall Jarratt, chairman (water and fuel supervisor, Southern Pacific, Tucson, Ariz.).  
12:00 noon—Adjournment for lunch.

### WEDNESDAY AFTERNOON

Afternoon session adjourned to permit members to visit the Coliseum at 1513 South Wabash avenue to inspect the exhibits of the Track Supply Association and the Bridge and Building Supply Association.  
(Turn to page 842 for list of exhibitors and floor plan of exhibit hall.)

### WEDNESDAY EVENING

(Grand Ballroom—Informal)

- 6:30 p.m.—Joint Annual Banquet of the Roadmasters' and Bridge and Building Associations—with Supply Associations.

### THURSDAY MORNING

September 17

- 9:30 a.m.—Report of Committee on Safety Education—Methods and Results—A. D. Henninger, chairman (supervisor safety, Minneapolis, St. Paul & Sault Ste. Marie, Minneapolis, Minn.).  
10:00 a.m.—Address on Preventive Planning, by Donald E. Mumford, manager safety, New York Central, New York.  
10:45 a.m.—Report of Committee on Where to Use Rigid or Spring Frogs—and Why—R. H. Carpenter, chairman (engineer of design, Missouri Pacific, St. Louis, Mo.).  
11:15 a.m.—Business Session.  
11:45 a.m.—Adjournment.  
9:30 a.m.—Report of Committee on Conversion of Shop Buildings for Diesel Maintenance—W. F. Armstrong, chairman (architectural engineer, Chicago & North Western, Chicago).  
10:15 a.m.—Report of Committee on Furnishing Water Under Emergency Conditions—E. R. Schlof, chairman (assistant superintendent water service, Illinois Central, Chicago).  
11:00 a.m.—Business Session.  
11:45 a.m.—Adjournment.

### THURSDAY AFTERNOON

- 1:30 p.m.—Leave Union Station on special train of Chicago, Milwaukee, St. Paul & Pacific to visit this road's modern retarder-classification yard under construction at Bensenville, Ill.  
4:30 p.m.—Arrive back at Union Station.  
1:30 p.m.—Short course on how to make quality concrete, to be presented by Portland Cement Association. Two films to be shown.  
5:00 p.m.—Adjournment.





ABOVE— Members of AREA Committee on Economics of Railway Labor saw economies aplenty in the Santa Fe's tie-renewal gang.

RIGHT— Three men at head end remove rail anchors "peel" tops of old ties as necessary, and dig "eyes" for tie-remover hooks.



Organization under development on Santa Fe for three years is seen in action near Houston, Tex., by the Committee on Economics of Railway Labor. Even though the new gang is showing substantial economies it is still considered in the development stage. Five relatively new types of machines are in regular use by the gang, and on the day of the inspection an improved four-unit hydraulic tamper was being demonstrated.

## AREA Committee Inspects

# Highly Mechanized Tie-Renewal Gang

● Houston, Tex., may not be an ideal place to hold a committee meeting in July but members of AREA Committee 22—Economics of Railway Labor—braved the humid heat on July 22 to learn how the Santa Fe is saving \$1.00 per tie in the cost of making maintenance tie renewals. What they saw was a 40-man highly mechanized gang which, during the morning of the day it was inspected, removed 352 old ties, cleaned out 332 tie beds, inserted 300 new ties, and tamped 250 of them. In achieving this output, which was about average, the gang was on the job 4½ hr., but due to a 30-min. train delay the time actually worked was 4 hr. For the entire day a total of 410 ties were inserted and tamped in slightly less than 5 hr. of actual on-track time.

### Tour of Inspection

On the day preceding that on which the inspection was made the committee held a routine meeting at the Shamrock hotel, Houston, which was directed by Chairman R. J. Gammie, chief engineer, Texas & Pacific. On the following morning the committee, which, the guests, comprised a group of about 50 persons, was transported in two buses provided by the

railroad to the point where the gang was working a short distance west of the city. The territory involved is the railroad's single-track line between Houston and Galveston. In addition to Santa Fe trains this line also carries traffic of the International-Great Northern to areas in southwest Texas and Burlington-Rock Island trains to Galveston.

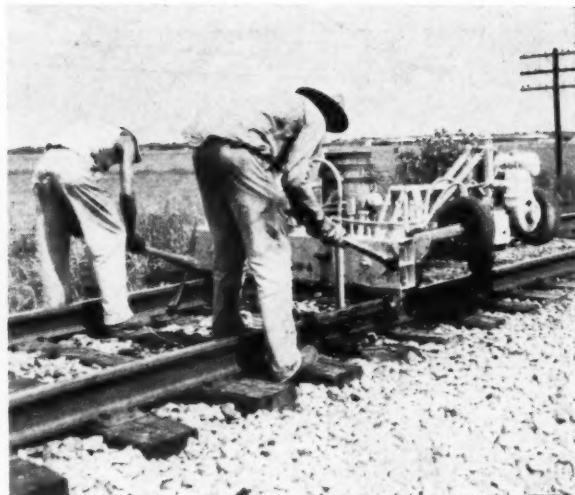
The line is laid with 112-lb. rail, and the standard construction consists of 7-in. by 8-in. by 9 ft. ties, placed 24 to the 39-ft. rail, 7½-in. by 11-in. double-shoulder tie plates, 4-hole 24-in. joint bars, 24 rail anchors per panel, and crushed limestone ballast placed to a depth of 8 in. under the ties.

### Regular Tie-Renewal Operation

During the committee meeting on July 21 copies of a typewritten description of the tie-renewal gang had been distributed among the committee members. It was pointed out in this write-up that the gang was engaged in a regular tie-renewal operation over about 19½ miles of line, that the tie renewals were averaging 400 to 450 per mile, and that all new ties are unloaded directly where needed from either a work train or local freight.



**PULLING SPIKES** from the ties to be renewed. One machine removes the spikes from both rails.



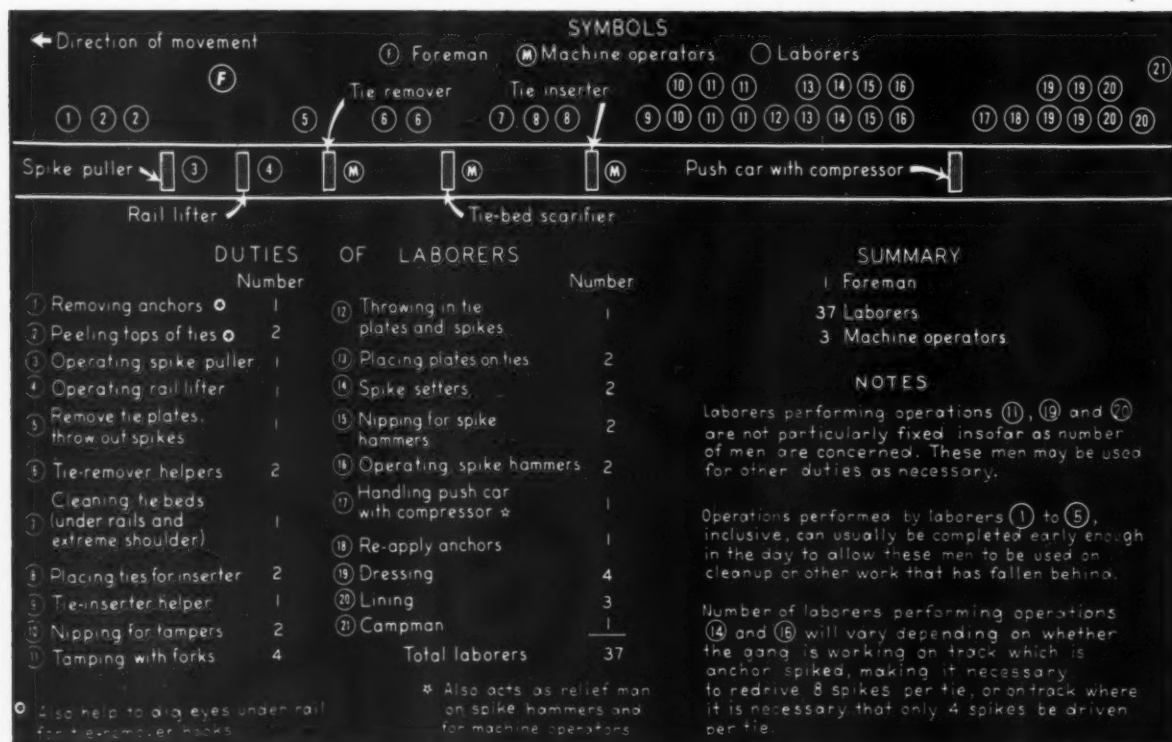
**RAIL LIFTER** raises the rails slightly at each tie to be renewed to facilitate removal of the tie plates.

It was also brought out that the equipment and organization to be seen by the committee were the result of three years of development work. The intention, when starting to work on the problem, was that the new organization would be used only in connection with maintenance tie renewals. However, for a period of about 1½ years excellent use was made of the gang in making heavy tie renewals in connection with out-of-face surfacing work. The gang was then returned to the work of maintenance tie renewals and has been engaged in that work ever since. What this means is that the ties are "dug in," no raise being made, and that

only the new ties which are placed in the track are tamped. This is the kind of operation Committee 22 saw near Houston.

### Development of Gang

When the gang was being developed various units of equipment and types of organization were tried out. At one time the gang was operating with as few as 20 men, while at another time it consisted of 55 men. It was pointed out that the design of all the machines used has been changed many times and that the



**ORGANIZATION CHART** for the tie gang in its present state of development. Efforts to improve it are continuing.



**TIE REMOVER** forces old ties out of track by means of hydraulic ram with teeth that bite into tie.



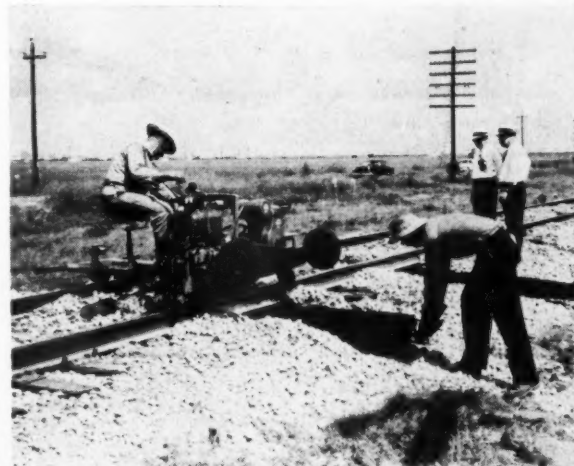
**TIE-BED SCARIFIER** cleans out and lowers old tie beds as necessary to facilitate insertion of new ties.

changes have been made in an effort to develop a more efficient and economical operation, through speeding up the work or reducing the number of men required. Efforts to improve the gang are continuing and both the railroad and the cooperating manufacturers are endeavoring to devise better and faster methods and machines. "The chances of doing this look very promising," it was stated.

#### Types of Equipment Used

Appended to the report was a tabulation giving the organization in detail of the tie-renewal gang, including the equipment used. This tabulation is reproduced here in the form of a chart. It will be noted that the principal units of equipment consist of a spike puller (Fairmont Model W84-A), a rail lifter (Fairmont Model W86-A), a tie-bed scarifier (Fairmont Model W87-A), and a tie inserter (Fairmont Model W69-A). In addition there are two pneumatic spike hammers driven by an Ingersoll-Rand Model 3R36 compressor carried on a push car.

All of these machines are shown in the photographs.



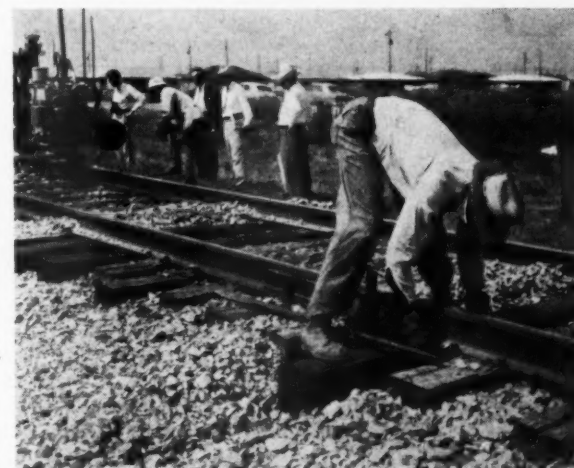
**TIE-INSERTER**, a self-propelled machine, pulls new ties into track after they have been lined up by two men.

#### Comparative Costs—Operation of Organized Tie Gang Versus Section-Force Renewals

	Tie Gang*	Section Gangs**
Average number laborers per day	36.1	6.0
Average man-hours per day (laborers)	285	48
Average cost per day—laborers, machine operators, timekeeper, foreman	\$495.62	\$80.11
Average number ties per day	384	37.3
Average miles per day	0.62	0.05
Average cost per tie (personnel only)	\$1.29	\$2.15
Average number man-hours per tie inserted	0.742	1.211
Average on-track time for machines	6 hr.	—
Average hourly rate (based on laborers' hours only and total cost)	\$1.74	\$1.78
Depreciation, repairs, fuel and oil costs per day	\$42.66	\$9.08
Total average cost per tie	\$1.40	\$2.40
Savings per day through use of tie gang (based on ties inserted by tie gang)	\$384.00	

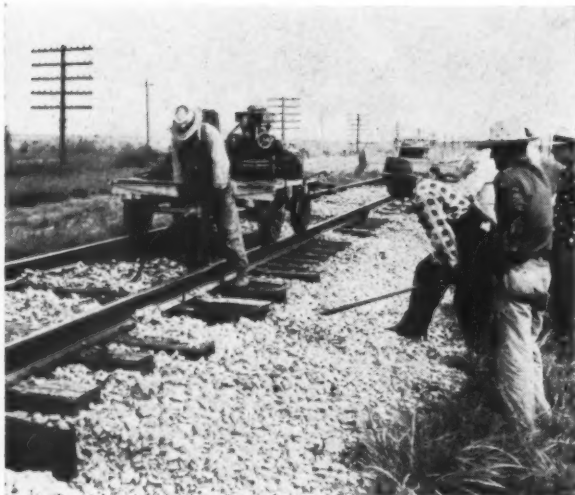
\* 50 consecutive work days.

\*\* 64 gang-days. Six different sections were used over a six-week period for this test. During test, each section inserted ties for three weeks. Every attempt was made to minimize competitive efforts.

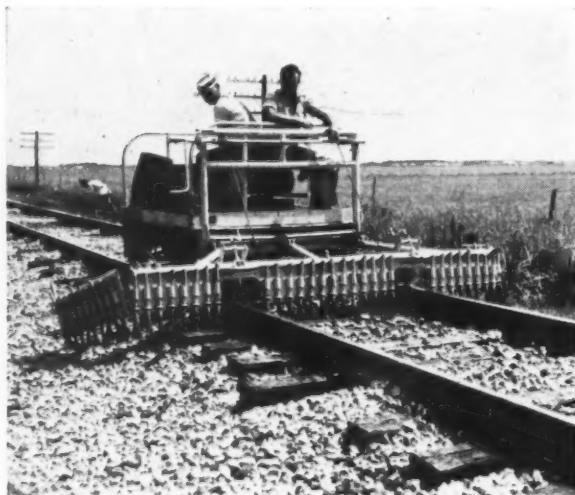


**TIE PLATES** are inserted with aid of small jack, which is necessary because ties have been tamped against rail base.





**SPIKE DRIVING** is done with air hammers powered by compressor on push car. One or two drivers are used as required.



**TRACK DRESSING** unit, developed by Santa Fe roadmaster, was being tested on the day the gang was inspected.



**RUBBER-TIRED** set-off wheels on most of the machines permit them to be taken from the track practically anywhere.

All of the on-track units except the tie-bed scarifier are each fitted with a pair of transverse pneumatic-tired wheels to facilitate removal from the track. When necessary to clear the track for a train the scarifier is moved to the nearest crossing or motor-car set off. Transverse rails for use in removing this unit from the track are carried on a push car behind it.

The functions of all of the machines are self-explanatory, with the possible exception of the rail lifter and the tie-bed scarifier. The purpose of the rail lifter is to raise the rails slightly at each tie to be renewed to facilitate removal of the tie plates. Soon after the development of the gang was started it became evident that some means must be devised to lower the old tie beds to facilitate insertion of the new ties which are generally thicker than the old ones. The tie-bed scarifier was developed to serve this need. Its purpose is accomplished by transverse rotating shafts fitted with a series of steel teeth. As the shafts are lowered into the tie bed the teeth dig out the ballast and throw it forward. Ballast remaining under the rails and on the extreme shoulder from where the new tie is to be inserted is removed by hand.

#### **Tie Inserter Improved**

The availability of the tie-bed scarifier made it possible to effect important improvements in the tie inserter. Because of the reduced resistance when a new tie is being forced into the old tie bed an inserter was designed which is considerably lighter in weight than the old one. The new machine is also completely self-propelled and is fitted with a seat for the operator. The self-propelling feature is expected to add considerably to the effectiveness of the unit. It was pointed out that "a man pushing a machine of this weight would naturally not be as effective during the latter half of the day as he would be during the morning."

The savings being realized with the new organization were given in the railroad's report by means of a statement showing production and cost figures of the mechanized tie gang compared with those of the section forces. This statement is reproduced here. It shows that the average daily production of the mechanized tie gang is 384 ties inserted, and that the average cost, including personnel only, is \$1.29 per tie, or \$1.40 per tie after all costs have been added. This compares with an over-all cost of \$2.40 per tie when done by section forces.

#### **Hydraulic Tamper Developed**

Although the new tie gang is considered an economical success in its present state of development it admittedly has some inadequacies which are now in the process of being corrected. According to the railroad's report one of the operations that needs improvement is the tamping effort. At the present time, this work is done by hand using ballast forks. As a solution to the problem of performing this operation more economically, Racine Hydraulics & Machinery, Inc., collaborating with the railroad, has developed a hydraulic, 4-tool tamper which, known as the "Hydra-Quad," is operated by one man. The most recent model of this machine had become available only a day before the inspection by Committee 22, and was being demonstrated on the day of the inspection. It was pointed out that two such machines could perform the tamping work for the gang at a considerable saving and that the quality of the work would be better than that obtained with present practices. The "Hydra-Quad" is pictured and described separately in an adjoining space.



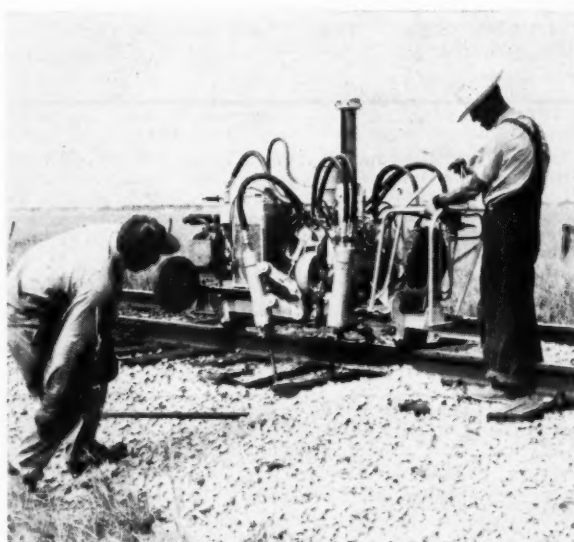
Another newly developed device was also being tested on the day of the inspection. Developed by a Santa Fe roadmaster its purpose is to do at least a partial job of dressing the track behind the tie-renewal gang. This device consists of a bracket fastened on the front end of a section motor car and carrying a series of closely spaced lengths of steel cable, mounted vertically and pointed downward so as to sweep loose ballast into the cribs. The shoulder ballast is shaped and dressed by inclined sections at the end of the bracket.

#### Santa Fe Men Were Hosts

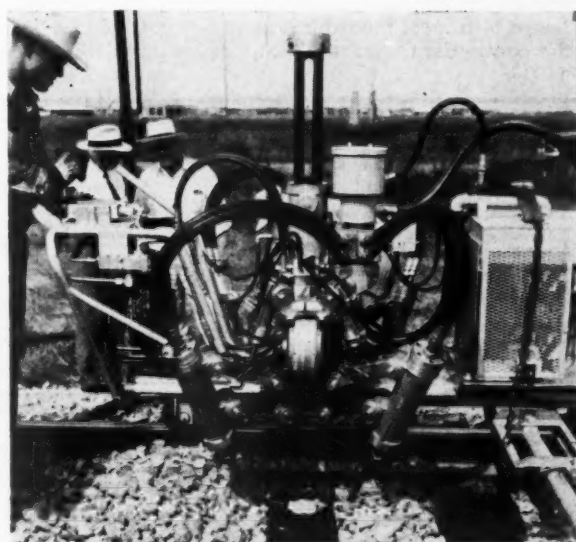
The new tie-renewal organization has been developed under the general supervision of T. A. Blair, chief engineer system of the Santa Fe, and R. H. Beeder, assistant chief engineer. During the inspection by Committee 22 Mr. Beeder headed a delegation of Santa Fe maintenance officers who were on hand to answer questions.

These included W. T. Donoho, chief engineer of the Gulf Lines, Galveston; J. R. Rushmer, roadway engineer, Amarillo, Tex.; C. F. Lewis, system superintendent of work equipment, Topeka, Kan.; J. E. Eisemann, district engineer, Galveston; G. M. Strachan, assistant engineer, Chicago; G. R. Collier, division engineer, Temple, Tex.; F. W. Morrow, supervisor work equipment, Gulf Lines, Cleburn, Tex.; W. L. Seabridge, division engineer, Galveston; R. F. Taggart, roadmaster, Alvin, Tex.; and J. C. Cook, equipment maintainer, Brownwood, Tex. The foreman is W. S. Wren. He has been in charge of the gang ever since its inception three years ago.

The inspection of the tie gang by Committee 22 was made in connection with its assignment to analyze "operations of railways that have substantially reduced the cost of labor required in maintenance-of-way work." G. A. Kellow, special representative of vice-president, Chicago, Milwaukee, St. Paul & Pacific, is chairman of the subcommittee handling this assignment.



"HYDRA-QUAD," a four-unit tamper operated by one man . . . . . has individual pantograph-type mounting for each tool.



#### Hydraulic Four-Unit Tamper

Working in collaboration with Santa Fe engineers, and with the particular needs of that road's new tie-renewal gang in mind, Racine Hydraulics & Machinery, Inc., Racine, Wisc., has developed a hydraulically powered four-tool tie tamper which is operated by one man. The new machine is known as the "Hydra-Quad." The latest model of this machine was being demonstrated on the day AEA Committee 22 made its inspection of the tie-renewal organization.

In the new unit the tamping assembly, together with the power plant, is supported over one rail on two flanged rollers, with an insulated outrigger extending to the opposite rail. The power plant consists of a low-pressure (500 psi) hydraulic pumping unit which is driven directly from the shaft of a 10-hp. Onan gasoline engine operating at 1900 r.p.m. The four tamping

tools are incorporated in an assembly that is mounted on a vertical shaft in such manner that it can be moved up and down, and the arrangement is such that, when the machine is in the operating position, the four tools straddle the tie, two outside and two inside the rail. Each tool has a separate bracket mounting, designed somewhat on the order of a pantograph, so that as the tamping proceeds the tools are tilted to force ballast under the ties at the proper depth.

Power is imparted to the tamping tools by means of a newly developed hydraulic accumulator and a specially designed valve which regulates the frequency of the tamping blows (1400 blows per minute are said to suffice in average tamping). The force of the blows is said to be adjustable to suit track and ballast conditions.

The tamping units are equipped with

quick-change tamping-bar holders. Each tamping tool acts as an independent unit. The entire mechanism is rubber-cushioned mounted and the basic design is said to incorporate a vibratory action that feeds the ballast to the face of the tamping bar. All motions of the tampers are controlled by two levers conveniently placed for the operator. The machine is pushed from tie to tie by the operator, and may be towed by a motor car when being moved from one location to another.

The over-all weight, including oil in the hydraulic system and full gasoline tank, is 1285 lbs. By means of lifting handles and two outboard rubber-tired wheels, it is said that three men can move the machine to and from the track. The outrigger is mounted off-center to permit the use of two machines on opposite rails so that both ends of a tie may be tamped simultaneously. The four-cycle air-cooled engine operates an hour on one filling of two gallons.

# Huge Exhibit at Coliseum



Wide variety of products, including many never before exhibited, will be on display at Chicago during Roadmasters' and Bridge and Building conventions.



● Every available bit of space in the exhibit hall of Chicago's Coliseum will be occupied by displays of manufacturers' products during the Roadmasters and Bridge Building conventions, September 15-17. With 126 companies participating, the exhibit is being sponsored by the Track Supply Association and the Bridge and Building Supply Association.

The conventions will start on Tuesday morning, September 15. For the benefit of those who may desire to inspect the exhibit before the conventions start, the doors of

the exhibition hall will open on Monday morning, September 14.

The exhibit will feature every conceivable type of product—materials, devices and machines—used in the construction and maintenance of railway tracks, bridges, buildings and water and fuel-service facilities. Many of the exhibiting companies—nearly 30 in fact—will be displaying their products at this exhibition for the first time.

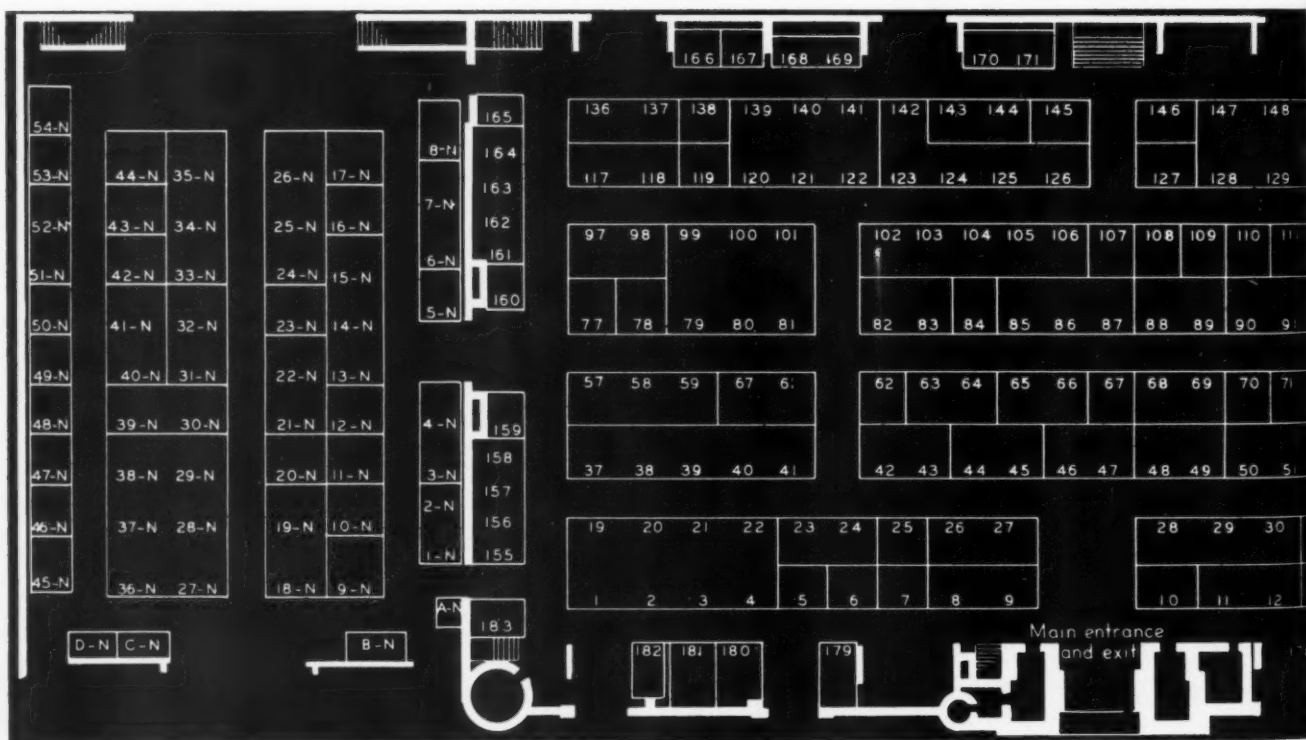
This will be the first exhibit to be held by these two associations since 1950. The officers in charge

of the arrangements for the Track Supply Association are R. W. Torbert, president (Oxweld Railroad Service Company), W. A. Maxwell, first vice-president (Ramapo Ajax Division, American Brake Shoe Company), and A. J. Reading, second vice-president (Chipman Chemical Company, Inc.). For the Bridge and Building Supply Association, the officers in charge are R. R. Clegg, president (American Lumber & Treating Co.), and H. R. Deubel, vice-president (Chicago Pneumatic Tool Company). Lewis Thomas (Q & C Co.) is secretary-treasurer of the Track Supply Association and also director of exhibits. A list of companies participating in the exhibit, together with a floor plan showing the exhibit spaces, is presented on these pages.

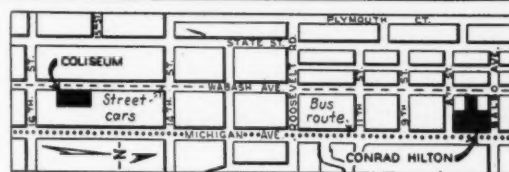
## List of Exhibitors

Achuff Railway Supply Company	16
American Brake Shoe Company, Ramapo Ajax Division	37-38-39-40-41
American Chemical & Paint Co.	D-N
American Hoist & Derrick Co.	11N
American Lumber & Treating Co.	78
American Railroad Curvelining	138
Armco Steel Corporation	26-27
Baldwin-Lima-Hamilton Corporation	67

Barber-Greene Company	27N-28N-29N-36N-37N-38N
Barco Manufacturing Company	25
Bernuth, Lembcke Co., Inc.	109
Binks Manufacturing Company	17N
Bird & Son, Inc.	21N-22N
The R. H. Bogle Company	10N
Briggs & Stratton Corp.	2S
Brushmaster Saw, Inc.	16N
The Buda Company	42-43
Caterpillar Tractor Company	92-93-94-95-96-112-113-114-115-116



Chicago Pneumatic Tool Company	84
Chipman Chemical Co., Inc.	48-49
Continental Motors Corporation	46N
Crofoot, Nielson & Co.	50N
Cullen-Friededt Company	65-66
Dearborn Chemical Company	44-45
The Duff Chemical Company	23N
The Duff-Norton Manufacturing Company	50-51
E. I. du Pont de Nemours & Co., Inc.	20N
Durable Mat Company	48N
Eaton Manufacturing Company, Reliance Division	82-83
Electric Taper & Equipment Co.	123-124-125-126-142
Enterprise Railway Equipment Company	47N
Eutectic Welding Alloys Corporation	8N
Fabreeka Products Company	175-176
Fairbanks, Morse & Co.	52-53-54-55-72-73-74-75
Fairmont Railway Motors, Inc.	128-129-130-131-132-133-134-135-147-148-149-150-151-152-153-154
Gary Slag Corporation	5N
General Chemical Division, Allied Chemical & Dye Corp.	179
Gorman-Rupp Company	C-N
The Brice Hayes Company	21S
Hayes Track Appliance Co.	146
The Hobart Brothers Company	40N-41N
Homelite Corporation	177-178
Hubbard & Co.	145
Illinois Bell Telephone Company	6N-7N
Industrial Brownhoist Corporation	5
Ingersoll-Rand Company	28-29-30
International Harvester Company	120-121-122-139-140-141
Irvington Form & Tank Corp.	81N
Jackson Vibrators, Inc.	143-144
Johns-Manville Sales Corporation	155-156-157-158
O. F. Jordan Company	71
Kalamazoo Manufacturing Company	57-58-59
Kershaw Manufacturing Company	23S-24S-25S-26S-27S-28S
Koehring Company	102-103-104-105-106
Wm. W. Lee & Son	172
The Lehon Company	70
Le Roi Company	68-69
LeTourneau-Westinghouse Company	22S
Link-Belt Speeder Corporation	77
The Locomotive Finished Material Company	108
The R. C. Mahon Company	54N
Maintenance Equipment Company	85-86-87
Mall Tool Company	11-12
Massey Concrete Products Company	160

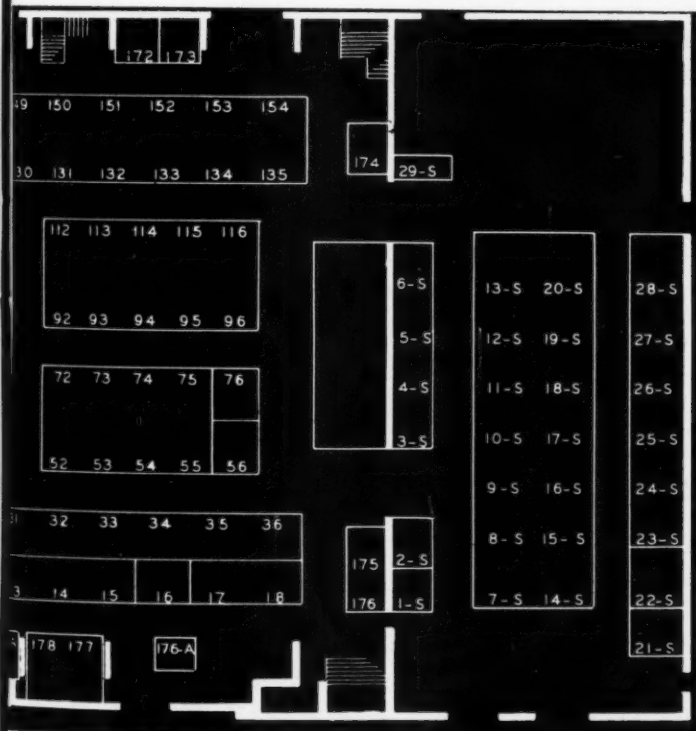


**WHAT:** The mammoth exhibit sponsored by the Track Supply and the Bridge & Building Supply Associations

**WHERE:** The Coliseum, 1513 South Wabash Avenue, Chicago

**WHEN:** September 14th through 17th. Hours: Open at 9:00 a.m. every day, closes at 5:00 p.m. Monday and Tuesday, 4:00 p.m. Wednesday, and 12:00 noon, Thursday.

The Master Builders Company	117-118
Matisa Equipment Corporation	42N-43N-44N
Mead Specialties Company	170-171
Mid-West Forging & Manufacturing Co.	183
Minnesota Mining & Mfg. Co.	51N-52N
Mississippi Supply Company	B-N
Modern Railroads	174
Morrison Railway Supply Corporation	6
Motorola Communications & Electronics, Inc.	1N-2N
Murdock Manufacturing & Supply Co.	A-N
National Aluminate Corporation	161-162-163-164
National Blue Print Company	176A
The National Lock Washer Company	97-98
The Nichols Engineering Company	45N
Nordberg Manufacturing Company	7S-8S-9S-10S-11S-12S-13S-14S-15S-16S-17S-18S-19S-20S
Northwestern Motor Company	33N-34N-35N
The Oliver Corporation	18N-19N
Oliver Iron & Steel Corp.	16S
D. W. Onan & Sons, Inc.	10
Oxwell Railroad Service Company	88-89
The P. & M. Co.	90-91
Pacific Coast Borax Company	168-169
Earl H. Pence & Co., Inc.	32N
Pettibone Mulliken Corporation	31-32-33-34-35-36
The Pocket List of Railroad Officials	62
Pullman-Standard Car Manufacturing Co.	1-2-3-4-19-20-21-22
The Q & C Co.	111
Racine Hydraulics & Machinery, Inc.	13-14-15
The Rail Joint Company, Inc.	60-61
Railroad Accessories Corporation	3N-4N
Railroad Products Company	182
Railroad Rubber Products, Inc.	1S
The Rails Company	127
Railway Ballast Conditioning	180
Railway Maintenance Corporation	79-80-81-99-100-101
Railway Purchases and Stores	159
Railway Track and Structures-Railway Age	76
Railway Track-work Company	13N-14N-15N
Reade Manufacturing Company, Inc.	8-9
Roseman Tractor Equipment Company	30N-39N
Rust-Oleum Corporation	119
Rydin Supply Company	9N
Safety First Shoe Company	181
Security Locknut Corporation	49N
Schramm, Inc.	7
Southern Amiesite Asphalt Company	53N
Sperry Products, Inc.	23-24
The Tapecoat Company	167
Taylor-Fibre Company	166
Teleweld, Inc.	110
Templeton, Kenly & Co.	46-47
Tidwell Tool Company	29S
Timber Engineering Company	173
True Temper Corporation	56
Gradall Division of Warner & Swasey Co.	24N-25N-26N
Warner Lewis Company	178A
Warren Tool Corporation	107
White Manufacturing Company	136-137
Wisconsin Motor Corporation	17-18
Woodings-Verona Tool Works	63-64
Woolery Machine Company	3S-4S-5S-6S
Young & Greenawalt Co.	12N







DEFECTIVE METAL being removed from a manganese frog in a shop with the new electrode. Note that the electrode is held almost horizontally for removing the old metal.



AFTER CUTTING away the defective metal, the surface of the base metal is said to be in an ideal condition for the rebuilding work.

## ***In Repairing Manganese Frogs . . .***

# **Electrode Removes Worn Metal**

● A special electrode, designated ChamferTrod DC, has been developed by the Eutectic Welding Alloys Corporation, New York, for use in removing metal from worn and cracked manganese frog castings in preparation for building them up by welding. ChamferTrod DC is an oxygenless electrode which is operated with a standard machine of 300 amp. or more capacity. It consists of a core wire heavily coated with a heat-resistant material that is reduced more slowly than the core. After an arc has been struck, this coating forms a tube through which the energy is concentrated and projected.

When used, the electrode is held almost horizontally to the surface of the metal to be grooved and, as it is pushed in the desired direction, unwanted metal is literally blasted from its path. It is claimed that the searing effect cleans the metal, leaving an ideal surface for welding, but is so rapid that the casting remains at a comfortable hand heat in the immediate vicinity. It is said that a sharply defined cut is obtained and that, owing to the speed of operation, there is little danger of metallurgical changes taking place in the structure of the base metal. Also, the cleaned surface is said to be free from oxide inclusions and embedded abrasive particles.

Other advantages claimed for this electrode are that the cracks in a casting will remain visible throughout the operation as the metal is forced away. Hence, since the extent of the crack can always be determined, the operation can be continued until the crack disappears.

The manufacturer also points out that it is relatively easy for a welder to change his operations from removing to building up metal and vice versa. All that is necessary is to exchange the ChamferTrod for a welding rod and adjust the amperage. If some of his welding work is not satisfactory to him, the welder can remove it by again exchanging rods.



IN REBUILDING a frog after the defective metal has been removed, the welder merely exchanges the ChamferTrod for a welding rod and adjusts the amperage.



This is the last of three articles on the qualifications needed by yard track foremen. The first, published in the June issue, was authored by G. M. O'Rourke, assistant engineer maintenance of way, Illinois Central. The second, published last month, was written by Malcolm E. Condon, general yard foreman, Erie. All three were submitted as answers to a question published in the What's the Answer department. Other answers to the same question were published in the May issue.



## Yard Track Foreman . . .

# Are Special Qualifications Needed?

By J. W. Diffenderfer

Supervisor of Track  
Pennsylvania, Johnstown, Pa.

● Did you ever hear of a track foreman taking a course in human relations? Just about every other type of official is taking courses in public and employee relations these days, but if there was ever a man that needed all the help he could get in the way of training, especially along the lines of human relations, it is the track foreman in a busy yard.

Why does he need such a course any more than any other foreman, you ask? Simply because he has to deal with a personality known as the yardmaster, general yardmaster, or whatever title is given the man in charge of a busy yard. That "personality" can be the making or breaking of a yard track foreman's ability to get work done.

It all boils down to the matter of cooperation between all persons working on the railroad, but in the

general course of the hectic activities of a day's troubles, the yardmaster can become a most obstinate individual, willing to put an instant halt to any constructive activity that might interfere with the operation of his trains. If a yard track foreman can tactfully state his desires and objectives and can win the yardmaster to his point of view, he has already mastered the biggest part of his tremendous job as the one in charge of track maintenance in that yard.

To save space, let's call our foreman, "Joe." Besides being a good psychologist, Joe must be an administrator and an executive, much more so than track foremen on other sections. How much time do we spend preparing plans and programs for yard work and rehabilitation, compared with the attention that main track work receives for comparable mileage? Isn't a good bit of it left up to the track foreman to decide, where he will work, how he will work it, and with what he will do it? Joe must

step in as an executive, and figure out what needs to be done. Often Joe faces a big problem, because he could stop almost anywhere and go to work. Then, it becomes a problem of what is the worst condition, what is the most important place, where will operations be affected the worst if difficulty should rise.

So many times, Joe doesn't get a chance to see his troubles until something does happen, for tracks are so often blocked solidly with cars during his working hours. When he does have the opportunity to check a track, Joe needs the ability to discern troublesome spots and know their most efficient remedy. Oftentimes, Joe becomes more of a first-aid specialist than a doctor. Unless he can tell what conditions cause a derailment and can recognize them, he is useless in a yard. Similarly, unless he can remedy them quickly before difficulties do happen, he has failed his purpose. In their desire to use material, show a lot of apparent progress, and cover up their inexperience

ence, a lot of "Joes" overlook small track defects that spell trouble and to the experienced man have the word "DERAILMENT" written all over them.

### Know Yardmaster's Job

Joe's track knowledge, executive ability, and human relations training must be coordinated with his ability as an administrator. It isn't enough that he simply know his own job and his men. He must know the yardmaster's job as well. Until he learns the operation so completely that he would almost run the yard himself, he will not be a success in accomplishing the work he has outlined. A knowledge of the operations of the yard and the problems of the yardmaster, no matter how eccentric he may seem to the average individual, is essential in not only winning the good will of the yardmaster, but also getting the most work done with the men assigned to the gang. It is important that Joe know when crews change tricks, what tracks are used for each different classification, when and where the pickups are made, each phase of the switching or humping operations, when lunch periods occur with their few moments of idleness that can mean so much to track repairs at strategic locations, and other details without end. Only when he has acquired a mastery of such knowledge can Joe coordinate his work with that of the yardmaster. With all due respect to the professors, psychologists, philosophers, and what have you in the world, unless Joe has learned the essentials of cooperation, all of the human relations courses he can get will do him no good whatsoever.

As an administrator, Joe should keep this motto before him: "Know what you want to do; then, go ahead and do it." Too many track foremen "go ahead and do it," without first knowing what they really want to do. It takes a lot of forethought and planning, but good administrative ability should not be above the requirements for a yard track foreman. Joe, if he wants to make something of himself as well as make his immediate work easier and much more effective, will measure up to these responsibilities.

### Must Plan in Advance

Much of the work of the ordinary section gang or large surfacing gang on the main line can be car-



"... Good quality labor is not always obtainable ..."

ried on without interference with or the knowledge of the operating people. Not so with the yard work. If tracks are not blocked with cars, Joe has to have the assurance that he can work on them a while without getting cut short in the middle of his work. On ladder tracks, running tracks, and humps, the matter of coordination and timing appears. So often, operating conditions prevent the use of a location that had been previously earmarked for repairs. Joe must maintain an ever-present ability to shift not only the location but also the nature of his work, always keeping in mind which is the most important and the most needy place requiring his attention. This requires an ability to plan his work and lay out what is going to be done far in advance; not just for one location, but for many locations. All of it must be done with the anticipation of minimum track usage. Once a job is started, time cannot be wasted running after tools and material that have been forgotten. Having a program of several jobs in mind, Joe can easily shift his working locations in accordance with the operating peculiarities of the day.

Some men cannot see much farther than the nose on their face. Track foremen, and a lot of other people,—are no exception. Joe can keep doing his duty day after day, but in the course of the years he

will sooner or later discover that he has accomplished little. Therefore, Joe must be able to plan his work, not only in terms of days, but also in terms of years. He should know in what consecutive order he should progress constructive reconditioning or rehabilitation work. His years of experience in that particular territory should enable him to be better equipped to determine the order of a progressive program than his supervisors, who may often be transferred from one location to another.

### Must Be a "Leader"

Joe faces another real problem that many of his main-line colleagues never experience, and that concerns the type of labor that he finds available in his area. With the yards and terminals so often concentrated around centers of large population and much industrial activity, good quality labor is not always obtainable at the price that Joe is able to offer his men. Competition becomes great for men who are willing to do the work and do it well. It cannot be said that Joe always ends up with the best class of workman obtainable. Nevertheless, he must get the work done, and in endeavoring to do that, Joe must draw upon his knowledge of handling and training men. As a foreman, he must be a leader more so



than any of his fellow foremen on the main line. With an inferior class of labor and "green" men, he must know how to train the men in work with which many of them are unfamiliar. The training of the new employee is sadly ignored by so many foremen, when in reality it stands as the key to the success of the new workman, his work, his attitude toward the company, and the whole gang. Compared with the relatively steady employment encountered in the more rural areas, the

large employment turnover in the urban areas where yards are located demands that the foreman must know how to train men to do their work in the most efficient manner.

#### Perform Work Safely

All these features of Joe's abilities mean nothing unless Joe knows how to perform his work safely. Yard foremen, away from the high speeds of the main line, often overlook the importance of proper clear-

ing of yard movements and the need for protecting their men from being struck by passing engines or cars. There are situations not encountered elsewhere that are peculiar to yard territories alone and to safe methods and condition. Not only must the gang be educated in safety in their working habits and methods, but also the men must be educated in observing and preventing the causing of conditions that would create safety hazards for the many employes of other departments using the yard facilities. Tripping hazards are a special curse to trainmen, continually climbing off or on cars and walking through yard tracks. Material dare not be left lying around in foot paths or at any place where men might trip over it. Cleaning up spilled lading—time consuming to say the least—is so essential.

These are not the detailed things that Joe should know. To write of them would fill many volumes. These have not included the things that Joe, together with every other track foreman, should know. They are presented so that Joe might have some idea of the special characteristics that he, as a track foreman in a busy yard, should have to do his work efficiently, safely and well.

Did you say where are we going to get a man like that to take care of our yard? Where are we going to get an administrator, executive, planner, psychologist, yardmaster, safety agent, and coordinator all bundled up into one track foreman? Set the standards high, and good railroad men can and will measure up to them.

## Only a Dream . . .

TRACK men of all ranks, whether foremen or engineers maintenance of way, will read with a chuckle the poem printed below, which describes a track foreman's astonishment when a trainmaster, an engineman and a master mechanic all attempt to take the responsibility for a derailment, holding that the track was blameless. Written by Albert T. Pearson, formerly a passenger conductor on the Monon, and now deceased, the poem is reprinted from the September, 1947, issue of the Monon Magazine.

#### Track Foreman's Dream

Extra seventy-four six went into the ditch  
At the switch just south of the tower,  
And ten cars went down the bank,  
And held Number Eight for an hour.

They called us all on the carpet  
The G.M. was sore it would seem,

Thought they'd give me the walk  
Till they started to talk  
Then I knew it was only a dream.

With his hand on the engineer's shoulder  
The trainmaster said with a sigh,  
It was not a low joint  
Or a battered switch point,  
He was taking the puzzle in high.

Then the engineer said with conviction,  
I can prove by the man in the tower  
When he gave me the ball  
I was rocking them all,  
And rolling them sixty an hour.

The master mechanic yelled loudly  
If you'll let me I'll prove in a jiff  
My department's to blame,  
I acknowledge with shame  
That the engine was rigid and stiff.

I'm not much at visions or dreaming  
It's seldom I sleep on my back,  
I can side-step and scheme,  
But it sure is a dream  
When they don't put the blame on the track.



## For Better Vegetation Control . . .



SPRAYING WIDTH of 24 ft. was one of the requirements for the new cars.



OPEN DECK at rear of each of the vegetation control cars provides space for lighting generator plant, gasoline storage and tools.



OPERATOR'S PANEL has levers and valves for all boom movements and for individual volume and pressure selectivity.

## M. P. Adds

Details of five vegetation control cars recently built by the Missouri Pacific Lines are given in this article. The road now has seven units of the new type, all built during the last two years. Also, a number of converted weed burners are now being modified to include features of the larger cars.

● Reflecting continued emphasis on proper equipment as assurance toward maximum efficiency, the Missouri Pacific Lines recently placed in service five new vegetation control sprayer cars for system operation, which supplement two similar units built last year. The decision to build large vegetation-control equipment for work-train operation was made by this road in 1951. The new equipment was considered necessary in order to increase the efficiency of weed control materials by controlled timing of the application of weed killer along the road's 10,000 miles of main tracks.

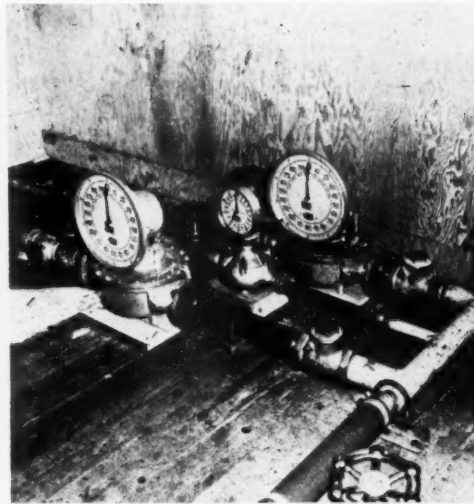
### Requirements Established

In developing this equipment, certain requirements were established, including: (1) A 24-ft. overall spraying width; (2) capacity sufficient for applying almost any weed killer; (3) equipment which would provide for the con-





**CONTROL-CAR INTERIOR** as seen from rear end. The dual pumps and engines are seen in the left foreground.



**METER arrangement** permits selection of three different materials for simultaneous spraying.

## to Weed-Sprayer Fleet

tinuous mixing of two, and sometimes three, different liquids in various percentages during operation, requiring that the materials be drawn directly from tank cars without premixing; and (4) speeds of the work-train units were to be 12 to 15 m.p.h.

Equipment selected for the cars consisted of Model R-85 Hykil sprayer units which were prefabricated by the W. T. Cox Company at its shops of Santa Ana, Calif. Actual installation of these units in cars built by the railroad was made at the Missouri Pacific's shops at Sedalia, Mo., and Palestine, Tex.

The first two cars, constructed in 1952, were in operation 160 days and treated 9,696 miles of track, including sidings. A daily average of 60.6 miles per work-train day was maintained during the 1952 season. Based on the successful results of the 1952 season, five additional units were constructed for 1953. Three of the new cars will be used on the road's Northern Lines, and one each on the International-Great Northern and the Gulf Coast Lines in Texas.

The pre-fabricated R-85 components included twin pumps and engines; triple meter manifolds for mixing materials in the pumps; and spray booms which are controlled by the two operators at the control panel. These units have a discharge capacity of 120 g.p.m. at 100 psi. Only one engine and

pump is used at a time—the other serves as a "standby" unit in case of failure of the other.

### Can Select Three Materials

The three-meter arrangement provides a selection of one, two, or three materials for mixing and spraying at the same time. Regulator valves may be set to proportion exact amounts of each of the materials being sprayed. The Missouri Pacific plans to apply aromatic weed killer oil, chemical, and water simultaneously. The oil and water will be sprayed on average vegetation in varying amounts and dilutions, subject to the degree of growth along the track. Chemical weed killer for specific vegetation problems will be added when needed. The control for changing these mixtures allows the operator to vary the treatment while spraying in order to meet the growth conditions encountered.

The sprayer cars are coupled to water supply cars, and a flexible hose connection is made to the oil cars for quick changing when necessary. A transfer piping arrangement allows water to be pumped from auxiliary sources back through the water lines into water cars. This feature is for use in areas where overhead water service is not available.

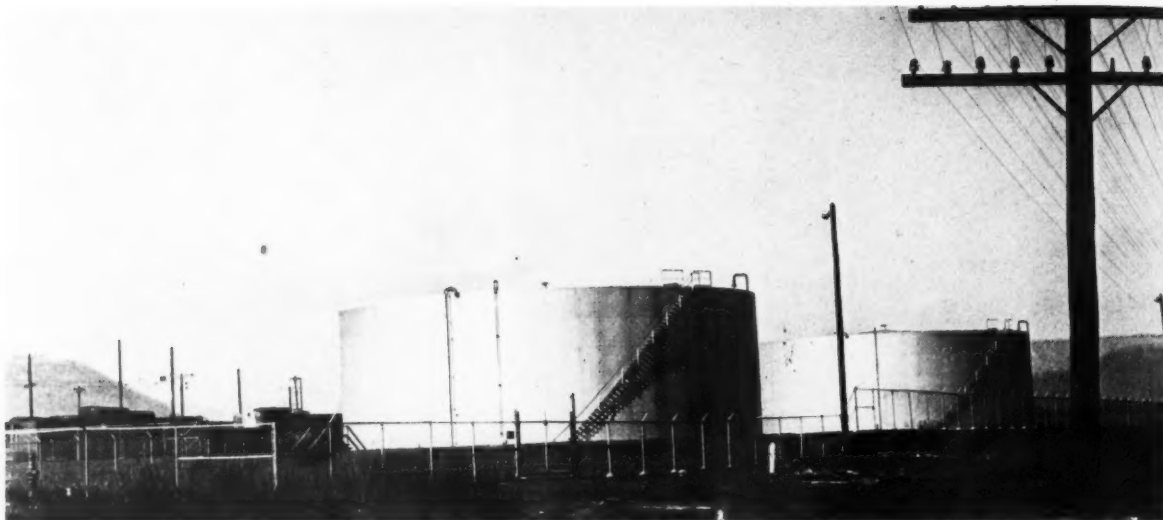
The pumping and spraying equipment utilizes Ford four-cyl-

inder industrial power units. All-bronze meters capable of handling any type of liquid weed killer are provided.

The operator's control panel features seven quick-opening hand valves for individual boom volume and pressure selectivity, hydraulic valves for boom lifting and lowering, as well as hand levers which allow the operator to swing the outside booms to any position, permitting their placement to proper positions relative to track, subgrade and clearances. The spray booms are constructed in seven nozzle segments to provide close control of spraying width and gallonage. This feature is said to allow operators to save materials by studying the condition of vegetation growth on the track ahead.

Other features include a complete headlight unit, horn and bell controls, three-color signal light device for flashing speed signals to the locomotive, two-way radio for efficient train operation, and a trainman's seat equipped with a hand emergency valve. The open-deck area at the rear of the car is utilized for tools, lighting generator plant, and fuel storage.

The spraying "fleet" also includes 15 self-propelled converted weed burners, some of which are now being modified to include many of the features of the larger cars. Hydraulic boom controls and individual valves to various segments of the spray booms, are a few of the modifications being made. It is planned to use these units for large yards, short branch lines and for emergency weed killing where needed.



AIR-FOAM SYSTEM, fully automatic, protects these 2,000,000-gal. fuel oil storage tanks on a large eastern railroad.

## Fire Protection at Diesel Facilities . . .

# Part III—Fuel-Oil Storage Tanks

In this, the third installment in his series of five articles on how to minimize the fire hazards existing at diesel fuel-oil facilities, Mr. Wicker points out the precautions which should be taken at and around storage and supply tanks and related piping. The next installment will deal with servicing buildings and repair shops.

By **W. S. Wicker**

Chief Engineer  
Transportation Mutual Insurance  
Company  
Philadelphia, Pa.

● The essential features to be considered in connection with the safe storage and handling of diesel fuel oil are: Approved tank construction and installation; tight piping connections with proper valves and fittings; the provision of dikes with sufficient areas and of suitable construction to retain oil in case of leakage, mechanical failure or boil-over; effective grounding for protection against lightning or accidental currents; and the provision of proper fire protection equipment with a volume adequate to control any fire which may occur.

### Construction and Installation

Storage facilities for diesel fuel oil on railroad properties range from single 8,000 to 10,000-gal. horizontal tanks at smaller terminals to

100,000 to 200,000-gal. single tanks at average locations and single or multiple tanks of 500,000 gal. capacity or larger at main storage terminals. Tanks constructed in accordance with the Standards of the National Board of Fire Underwriters' Pamphlet No. 30, or the American Petroleum Institute's Pamphlets Nos. 12-A or 12-C, will give little trouble and it is desirable that these standards be adhered to in all cases. In some of the earlier installations the smaller storage and supply tanks were buried but such tanks are now usually installed above ground on concrete piers in order to facilitate inspection and to quickly detect leaks that may develop.

The unprotected steel supports are not approved for oil storage tanks. Large above-ground tanks are installed, if possible, where they will not expose other property, but under no circumstances is it desirable to vary from the minimum distances outlined in National Board of Fire Underwriters' Pamphlet

No. 30. Above-ground tanks are equipped either with steel roofs with explosion-proof hatches and suitable vents, or with floating roofs. While floating roofs are used by some of the oil companies they are not generally recommended for snow areas. So far as is known there are no diesel fuel oil storage tanks with floating roofs on railroad properties. The provision of vents, explosion vents and flame arresters on diesel oil storage tanks is required and is simply an added precaution to reduce the possibility of fire.

Small tanks for daily service are invariably located near the tracks. Where gravity filling from the main tanks is used, indicating oil-level gauges are usually provided. Gravity flow of diesel fuel oil from main tank to supply tank, or from supply tank to tanks on diesel locomotives is not recommended under any circumstances. In emergency handling and storage of diesel fuel oil perhaps the safest procedure, in case of interruption of tank-car delivery or breakdown of railroad fuel-oil handling facilities, is to purchase temporary supplies from one of the oil companies and arrange for tank truck delivery to supply tank or direct to diesel locomotives. Pumps and oil tanks on flat cars have been used in emergencies. Regardless of the methods used, it is essential that extreme



**PROPER DRAINAGE** of diked areas around oil storage tanks is necessary for the removal of water accumulated from rainfall.

care be taken in handling fuel oil in all emergency uses and that adequate fire protection equipment is immediately available.

Some, if not all, of the oil companies require a thorough inspection of all tanks containing light oils once every five years, while those containing heavy oils are carefully gone over once every ten years. These thorough inspections include gauging the tank metal throughout by drilling. An external inspection of all tanks is made annually. The railroads would be considerably benefitted by adopting a program of similar tests on all storage tanks containing flammable liquids, where present tank inspection methods are less thorough than those outlined.

#### **Grounding**

All diesel fuel-oil storage tanks must be set on firm foundations and electrically grounded. One of the hazards in connection with oil-storage tanks is the danger from lightning, particularly if the tanks are not electrically grounded. While the record indicates but few losses from this source, the danger is always present where electric storms are prevalent, particularly in valley territories. Grounding of tanks and pipe lines is necessary in electrified territories and is desirable in all territories because of stray currents from static charges. A false sense of security may exist with regard to the grounding of tanks and piping for, if the details are not carefully performed, the anticipated protection will not be secured. Perfect bonding between the metal of the tank and the grounded cable is

best secured by welding, for clamped or soldered connections too frequently become loose. In a like manner, the grounding cable can be welded to the copper ground plate or electrode.

If necessary to secure better conductivity than provided by the surrounding earth the ground plate may be placed in charcoal. The size of the grounding cable should be adequate to afford conductivity for the probable electrical discharge during lightning storms and should not be less than No. 4 AWG. The grounding cables on existing tanks may have become detached and thereby ineffective. Periodic checking is necessary. At older installations grounding cables and electrodes may not have been installed and will have to be provided. In connection with the construction and grounding of piping systems and storage tanks for flammable liquids, reference is made to Association of American Railroads' Circulars, Series 17, and also to American Petroleum Institute Standards Nos. 12-A and 12-C.

#### **Piping and Valves**

While attention is usually concentrated on the tank installation and the grounding for protection against any probable source of weakness, a particularly important item is the matter of connecting pipe lines and valves that control the flow of oil. Mechanical fracture and serious leakage may result, not only from impact, but also by the settlement of pipes or connections, or by frost action. American Petroleum Institute Standard No. 12-C, Appendix C, advocates that the

following precautions be taken:

Provision should be made to guard against loss of contents of tanks in case of fire, earthquake, settlement or other mishaps. Illustrative methods are:

(a) The use of internal valve which will automatically close in case of fire.

(b) The use of steel body valves next to tank nozzles and drain connections.

(c) The provision of flexibility in piping connections to permit movement due to settlement or earthquake.

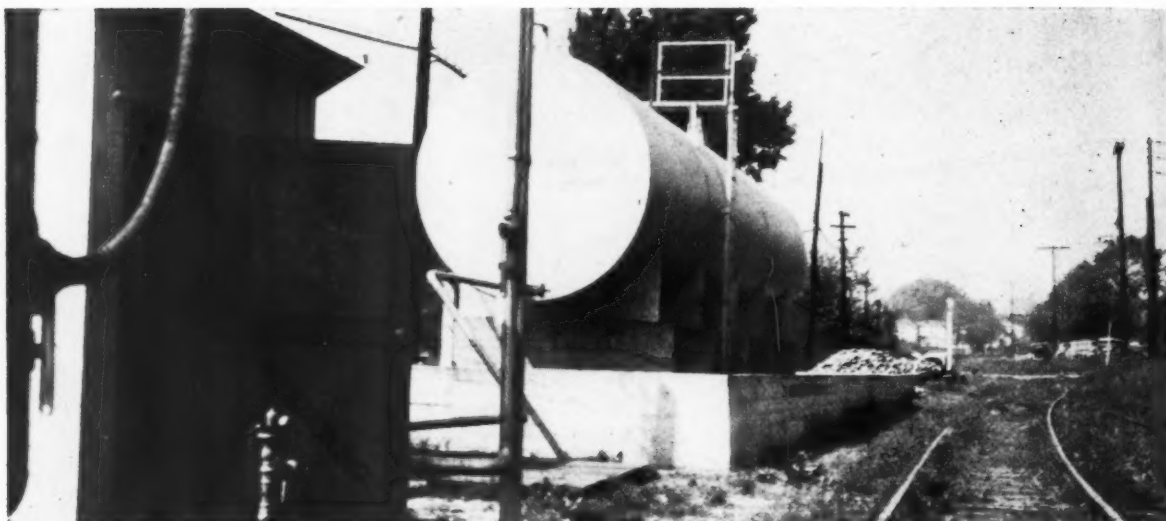
(d) The location of a roof man-hole over bottom draw-off connections where internal valves are not used.

(e) The use of swing lines which may be raised above the maximum liquid level.

(f) Tank runways which extend from one part of a tank to any part of an adjacent tank or to ground or other structure, so supported as to permit free relative movement of the structures joined by the runway. This may be accomplished by fixed attachment of the runway to one tank but with a slip joint at the point of contact between the runway and the other tanks. This is to permit either tank to settle or be disrupted by an explosion without endangering the other.

Much trouble is caused by the tendency of diesel fuel oil to leak or seep through any joint other than a welded connection, even if the installations are made by expert pipe fitters or mechanics. The thread dressings and sealant compounds which have so far been used are not entirely successful in preventing some seepage. Modern methods





CONCRETE DIKES around storage tanks are necessary where space is too restricted to permit use of earth dikes.

of welding joints have eliminated many sources of potential leakage but it is not practicable to weld every joint in diesel fuel oil handling systems, particularly at pump-houses.

#### Dikes Should Be Provided

Dikes around tanks may seem to be an unnecessary refinement to those not familiar with fuel-oil storage problems. While the record of oil storage tanks indicates but relatively few failures, it is always physically possible that mechanical failure may occur from some cause not predictable at the time the installation was made. Some moving object such as cars or a locomotive derailed from an adjacent track, or a truck out of control on the roadway may come in contact with the container with sufficient violence to cause rupture. Dikes of sufficient capacity to hold the entire contents should be provided around each tank having a capacity of over 15,000 gal. Smaller tanks may be paired in dikes if the aggregate capacity does not exceed 50,000 gal.

The provision of a suitable drain pipe for each diked area with a valve outside of the dike is necessary for the removal of water accumulated from natural precipitation. The contention that dike drains are not necessary in sandy locations is not borne out by experience. Even in sandy locations oil leakage eventually coats the bottom of diked enclosures with an impervious mixture of sand and oil and the water will not seep through.

The dike valves, normally closed, should be opened only when necessary to drain water from the diked

area and closed immediately after drainage is completed. One may ask why it is necessary to have dike drains at all, and why be so meticulous in requiring that drain valves be kept closed at all times except when water is actually being removed? The dikes are designed to hold the full capacity of each enclosed tank. If the enclosure is partly filled with water and a tank rupture occurs, the oil, being the lighter liquid, will float on the water and eventually flow over the top of the dike. If the drain valve is left open, oil from a tank rupture will escape from the diked enclosure. Each of these contingencies will defeat the sole purpose of the dike which is to retain the contents in case of a ruptured pipe or oil tank.

The nature of the materials selected in the construction of earth dikes must be such as to compact thoroughly without voids and to have at all times sufficient mass to resist any pressure that would be exerted by oil retained within the enclosure. Cinders and similar porous materials are definitely unsuitable for this purpose. The compacting of the material, usually accomplished with the aid of water as it is placed, is absolutely necessary to secure an impervious mass. Stabilization is further secured by keeping the successive layers horizontal. Locations on porous ground will require treatment to prevent any liquid seeping through to find outlet beyond the limits of the diked enclosure. Sufficient width at the top of the dike will add to its stability and take care of any moderate removal of material by subsequent erosion. The erosion of earth dikes,

however, can be prevented by planting grass of a variety with long roots that will bind the material. During the fall and winter months, however, it will be necessary to keep grass on the dikes and within the diked enclosures scalped clean to avoid the hazards of grass fires.

Where the space is not large enough in restricted areas to build earth dikes it is necessary to provide reinforced concrete dikes. The reinforcing rods must be at least 2 in. from the interior and exterior surfaces of the concrete dikes to prevent spalling from heat generated by burning oil should ignition occur after escape from the tank or pipe system.

Regardless of the type selected the dike should be regarded and maintained as a permanent facility to afford the protection for which it was constructed. During an emergency it may well prove to be a valuable asset.

#### Fire-Fighting Equipment

Foam installations are generally recommended for the extinguishment of oil fires and the protection of oil-storage tanks because of the inherent advantages over other extinguishing agents. There are two types of foam used. The older type is chemical foam while mechanical or air foam is the newer development. Many railroads prefer the use of air foam because of its comparatively low water consumption, its excellent range and the possibility of changing from a foam to a water stream at will, simply by a movement of the hand. The available water pressure governs the length of the hose lines.





**SAFE PRACTICE** requires that grass within diked areas be scalped clean during fall and winter months to avoid fires.

The production of air foam can be secured either by the use of a premixed solution or by picking up the foam compound and air at any point on the hose line. Limited personnel can satisfactorily handle air-foam installations. Air-foam producers are available in both low and high expansion types. The ratios are from 8-10 to 1 for low expansion and from 16-20 to 1 for the high-expansion type. That is, with the low expansion type 94 gal. of water and 6 gal. of foam solution will produce about 1,000 gal. of foam. The same proportions of high expansion foam compound will produce better than 1,600 gal. These are frequently referred to as the 3-per cent and 6-per cent foam compounds. Special foam-producing equipment is available for each type. While both types are recommended for the extinguishment of oil fires, a large number of railroads use high-expansion air foam because of its obvious advantages.

For smaller installations a playpipe with pick-up tube attached to a fire hose draws the correctly proportioned compound from a portable container. Where larger volumes of foam are required, a proportioning tank system is used. The size of the installation is governed by the number of individual oil-storage tanks and their capacities. Built-in foam systems are recommended for tanks of 200,000 gal. capacity and larger. Effective protection for tanks up to 60 ft. in diameter can best be provided by the use of two foam-solution proportioning tanks of 20 gal. capacity each for the larger facilities and two 10 gal. tanks for the smaller. Twin proportioning tanks make it pos-

sible to maintain a continuous foam supply by alternate refilling. One complete charge of the solution should be kept immediately available at the twin tanks.

Pipe lines, controlled by proper valves, extend from the proportioning tanks to the foam makers on oil-storage tanks or to hose connections equipped with suitable playpipes where it is necessary to protect against spillage or ground fires. For tanks requiring a larger volume of foam, other methods of introducing the compound are necessary. Foam makers large enough to discharge several thousand gallons of foam per minute are available and playpipes of comparable capacity can be secured. Automatic and remote-control foam systems have also been installed at large railroad oil-storage facilities. All of the above is predicated on an adequate water supply under sufficient pressure for fire streams. The wisdom of providing foam protection of oil storage facilities has been thoroughly demonstrated by the petroleum industry.

#### **Air Agitation**

A new development in the control and possible extinguishment of fires in flammable liquids with flash point above 125 deg. F. by using air agitation has been explored by one of the oil companies. Fires in oil-storage tanks develop, not from the burning liquid itself, but from the vapor generated when such liquid is heated. The surface of the oil is thereby kept hot and vapors form in sufficient volume to support continuous large-scale combustion. Any agitation of the oil in tanks

which tends to raise cool liquid from the bottom to the surface will reduce surface temperature and the rate of vaporization, and will thereby reduce the volume and intensity of the fire. In some instances this reduction is sufficient to make extinguished with foam, fog or dry chemical comparatively easy while in other cases the fire is completely extinguished by the air agitation.

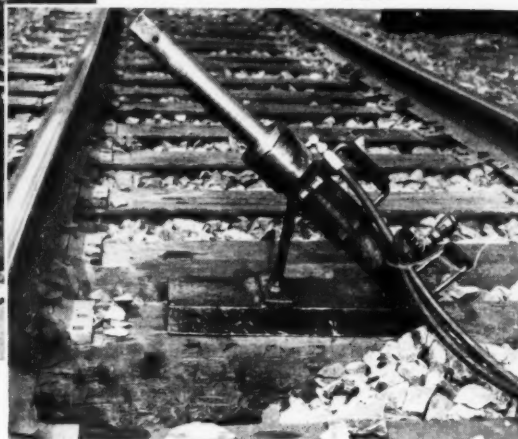
#### **Further Tests Needed**

While sufficient possible advantages as well as definite limitations of air agitation as a means of controlling oil fires are indicated, further large-scale tests are necessary to accurately determine the importance of salient factors incidental to this process. If there is a simpler and less expensive method of adequately protecting oil-storage tanks it would be of decided advantage at storage facilities where the more expensive methods of protection can not be secured. Air agitation for the protection of oil-storage facilities would be of particular interest and advantage to the railroads, for an adequate supply of air is already available at most terminals.

Such are the developments and the possibilities for providing adequate fire protection of oil-storage facilities. The securing of suitable protection for as many of the oil-storage facilities on railroad properties as economy permits is earnestly recommended, not only to reduce fire losses but also to avoid those larger losses involving interruption of operation which may be caused by an unanticipated depletion of the fuel supply.



**TRACK-LINING** device developed on the Lackawanna consists of a hydraulic ram with special mounting (below) by means of which the reaction is transmitted to the ballast. When lining curves two of the rams are used as shown at the left.



**New Aid for M/W Economy . . .**

## Hydraulic Rams for Lining Track

Equipment developed on the Delaware, Lackawanna & Western is operated in outfits consisting of two hydraulic rams with special mountings and a portable power plant. This article describes the equipment and tells how it is used.



**POWER PLANT** for operating the track-lining rams consists of gasoline engine driving a hydraulic pump. Single lever controls both rams.

● Important savings in lining track now being realized on the Delaware, Lackawanna & Western through the use of a new hydraulically operated track liner devised and developed by Bernard Geier, engineer of design and equipment of the railroad. Until the new equipment became available, out-of-face lining work on this road was done by hand with lining bars, using a gang of 12 men. With the new equipment only five men are needed.

Each of the new outfits consists of two hydraulic rams and a portable power plant which is mounted on two flanged rollers so that it can be supported and moved along on one rail. Each ram has a capacity of about 10 tons and is mounted at an angle of about 45 deg. on a steel base. To use the rams a hole is first dug in the ballast between the rails and adjacent to the rail in the direction the track is to be thrown. The ram is then placed in the hole with the piston bearing against the web and under the ball of the rail and with the base bearing against the ballast. The reaction of the ram is thus transmitted through the base to the ballast. Having a weight of only 65 lb. the rams may each be handled by one man using



**ABOVE**—When lining curves a "scratch board," referenced to a tack in a tie of the other track, is used to indicate the amount of throw.

**LEFT**—Holes for the rams are dug in the cribs by two of the five men comprising the track-lining gang. One ram can shift track on tangent.

two conveniently located lifting handles.

The power plant consists of a single-cylinder 2-hp. gasoline engine driving a hydraulic pump having a speed of 900 r.p.m. and developing a pressure of 4,200 psi. A single lever on the machine controls both rams. Two push handles are mounted at each end of the power plant, and an outrigger, for bearing on the ties, is provided to keep it in an upright position.

The plan on the Lackawanna is to acquire a total of 11 of the hydraulic track-lining outfits. One of these is now in use behind the road's system "detour" tie-renewal and surfacing gang. Three others will be used behind the company's three Matisa tamping gangs. One of the outfits will also be provided for each of the company's seven divisions. Eventually it is also planned to place one of the hydraulic rams in the hands of each section foreman, along with a hand-operated hydraulic pump for operating it.

When track is to be surfaced out of face on this road the practice is to stringline the curves in advance. A "scratch board" is used to reference the original position of the inside rail of the track to be lined to the adjacent main track. The scratch board has three "steps" at 6-in. intervals on one end and a vertical piece of metal on the other to make the "scratch." After the track is referenced and the throws



**SIGHTING** instruments are generally used when lining tangent track.

determined by a curveliner machine, a tack is placed either inside or outside of "scratch" on the tie at a distance equal to the throw. The "scratch board" is again used in the same position as when the track was referenced and the track is thrown until the metal tip on the board is directly on the tack.

The practice when lining a curve with the hydraulic rams is to proceed progressively around the curve, throwing the track to line at each of the stringline stations which are 31 ft. apart. On curves the two rams are placed with a tie crib between them at each spotting. When the entire curve has been lined over at the stringline stations the gang goes back and smooths it out by sight lining at the midpoints between stations.

When working on tangent track,

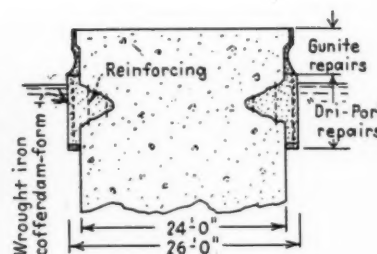
which is generally lined with sighting instruments, the rams are spotted at joints and centers. One of the rams has sufficient power to shift straight track and for this reason the rams are used as single units. One of the rams is carried forward and positioned while the other is throwing the track at the last previous spotting.

In the five-man gang used with each of the hydraulic lining outfits one man operates the power plant, two men clean the ballast from the cribs where the rams are to be positioned, and two men handle the rams. When working on curved track an additional man is needed to handle the "scratch board."

The Railway Track-work Company, Philadelphia, Pa., has obtained the manufacturing and sales right for the device.



## Pier With Bad Concrete Gets



**DETERIORATION** of concrete extended to depths of 12 in. to 48 in. This cross section shows how wrought-iron cofferdam-form was used in repair work.

**FABRICATION** of cofferdam was hampered by restricted space. It was erected in sections just underneath bottom chords and then lowered into position.

## Underwater Repairs "in the Dry"

Alternate freezing and thawing, plus erosion and other factors, resulted in serious deterioration of the concrete in the center pier of a swing bridge on the Baltimore & Ohio. This article tells how a wrought iron cofferdam form was placed around the pier and dewatered as repairs were made.

● Recently the concrete center pier supporting the Baltimore & Ohio's swing span over Bear Creek near Baltimore, Md., which had become badly deteriorated in the vicinity of the water line, was repaired and encased "in the dry" for an average depth of 6 ft. below mean low tide. Utilizing many of its "DRI-POR" underwater repair techniques and working closely with railroad engineers, the contractor, Masonry Resurfacing & Construction Co., Inc., Baltimore, devised a special plan of procedure to meet the problems involved.

As a preliminary step the railroad instituted a sub surface inspection of the pier by diver which indicated that between mean low and mean high water, the pier was deteriorated to a depth from the periphery varying anywhere from 12 in. to 48 in. Plans were then drawn by the railroad indicating the following general repair procedure:

(1) Fabricate a wrought-iron circular form 16 in. larger in radius than the pier, which would be used both as a cofferdam and a concrete form.

(2) Erect and seal this cofferdam around the pier so that its bottom plate would be about 30 in. below the lowest point of deterioration.

(3) Tremie a 12-in. layer of concrete in the bottom of the cofferdam to provide a seal so that the cofferdam could be dewatered.

(4) After the seal sets, dewater the cofferdam and remove all deteriorated concrete with pneumatic chipping hammers. Place reinforcing steel and fill the cofferdam with a high-strength air-entrained concrete, leaving the



**SUPPORTING BRACES** and angle brackets were needed to counteract uplift of cofferdam and also weight of concrete. **DEWATERED COFFERDAM** allowed sufficient space for workmen to enter and remove bad concrete with air tools.



wrought iron cofferdam-form in place as a permanent part of the pier.

The engineering principles behind this approach to the repair work are as follows:

(1) Doing all work "in the dry" allows for visual inspection, removing disintegrated concrete, completely and thoroughly welding all reinforcing and eliminating guess work during the pouring of the concrete.

(2) Leaving the form in place and making the encasement about 16 in. larger all around will, it is reasoned, probably more than compensate the railroad in longer service life for the pier.

Generally speaking, the construction procedure outlined above was followed by the contractor except for the tremie work. He eliminated this item and elected to effect "DRI-POR" type seals which were designed to keep the cofferdam dry at all times.

### Run Into Problems

With the general procedure established numerous problems akin to those always present in construction work presented themselves during the preliminary planning stages. The major "fly in the ointment" was the fact that the swing span had to be opened for waterborne traffic quite frequently. Hence, the use of heavy floating equipment, which would have facilitated cofferdam erection, was out of the question. Consequently the cofferdam had to be broken down into small sections for hand erection. This type of fabrication, of course, increased the number of possible points of leakage.

Even the hand-erection procedure was hampered because the actual working space between mean low water and the swing span was only 6 ft. and the cofferdam was 8 ft. in length. To circumvent this problem the erection had to be done during low tides or at least when the water was low enough to work on the lower portion of the cofferdam.

In addition, the cofferdam could not be suspended from the swing span since the latter had to be free to allow water traffic to get through. This necessitated the design of special hangers and jacking procedures for setting the caisson in place.

The final and major problem was that of pouring the concrete. The nearest shore was some 800 ft. away and accessible by rail or water only. Because of wind vagaries and other circumstances, the water route was rejected as hazardous and uncertain. The simplest procedure using the rail route was to load trucks on a flat

car and haul them to the site where they would deposit the concrete directly into the forms. The ready mix contractor rejected this plan so that an alternate method requiring a railroad crane had to be used.

With these problems temporarily solved, the cofferdam was fabricated and match-marked by the railroad. All materials were then sent to the yard of the contractor at Curtis bay where the final touches were added. The cofferdam sections were loaded on barges, along with the contractor's equipment (pumps, welder, etc.) and towed across Baltimore harbor to Bear creek.

### Erection of Cofferdam

Upon arrival at the job site, the cofferdam was erected (partially submerged and in sections) so as to clear the bottom chord of the swing span. After assembly of the cofferdam all joints were checked for water tightness and the cofferdam was then lowered to its final position and clamped in place. Thereupon a pump was started and the water level in the cofferdam began to drop, indicating that the gasket seals were functioning.

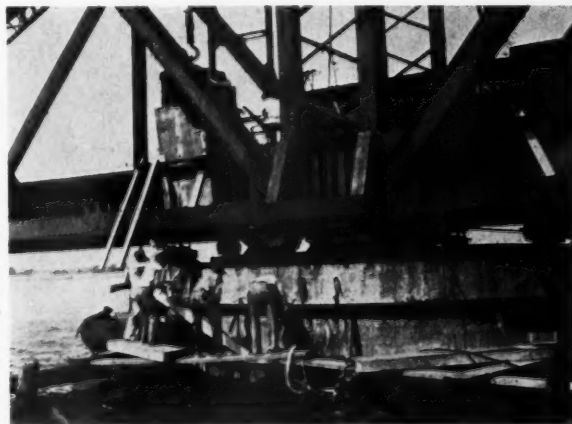
Before the cofferdam was entirely dewatered, braces and angle brackets were attached to the cofferdam and connected to the pier. They were designed to counteract uplift of the cofferdam due to hydrostatic pressure and also the downward and outward forces imposed by the weight of freshly poured concrete. The cofferdam was then completely dewatered; minor leaks occurred but were caulked immediately. A sump pump was used to remove any water that might infiltrate during repair.

A visual inspection was then made to determine the actual extent of the deterioration. It was found that the disintegrated area completely encircled the pier and varied from 12 in. to 48 in. in depth, which was what the diver had indicated. Upstream and downstream points on the pier (points of zero stream velocity) had approximately 12 in. of deterioration. Points 90 deg. away (points of maximum velocity) on either side had approximately 24 in. of deterioration. The maximum deterioration of 48 in. occurred at a point midway between two of the nodal points (zero and maximum velocity points).

This seeming lack of uniformity or of a definite overall deterioration pattern aroused speculation as to its cause. A closer visual inspection revealed that at the point of deepest deterioration there was a wide band (maximum 6 in. thick) of a soft grayish clayey material which undoubtedly consisted of hydrated cement and other very



LAITANCE SEAM and deteriorated condition of concrete are seen in this view inside cofferdam below water line.



POURING OF CONCRETE into cofferdam was facilitated by vertical chutes or hoppers extending down to lower chord.



**VIBRATORS** were used to consolidate concrete. The ready-mix concrete was dumped from 1-yd. buckets carried on flat cars.



**AFTER SEVEN-DAY** curing period brackets for cofferdam were removed to permit repairs on upper section of pier.



**RENOVATED PIER** as it appeared after the upper section had been Gunited following removal of deteriorated concrete.

fine materials. It was reasoned that a laitance seam had developed during the original construction of the pier.

Based on the visual inspection of the following assumptions were made concerning the cause of deterioration:

1. Deterioration due to alternate freezing and thawing, chemical action and possibly other factors resulted in approximately 12 in. of eroded concrete.

2. Scouring at points of maximum velocity added about 12 in. to the deterioration, making it approximately 24 in. at these points.

3. The laitance seam created an area of additional weakness which resulted in the point of accelerated deterioration.

### Making the Repairs

All power tools used on this job were pneumatically operated with compressed air piped from a 365-c.f.m. compressor on shore. All supplies and equipment were stored on two barges which were tied adjacent to the pier.

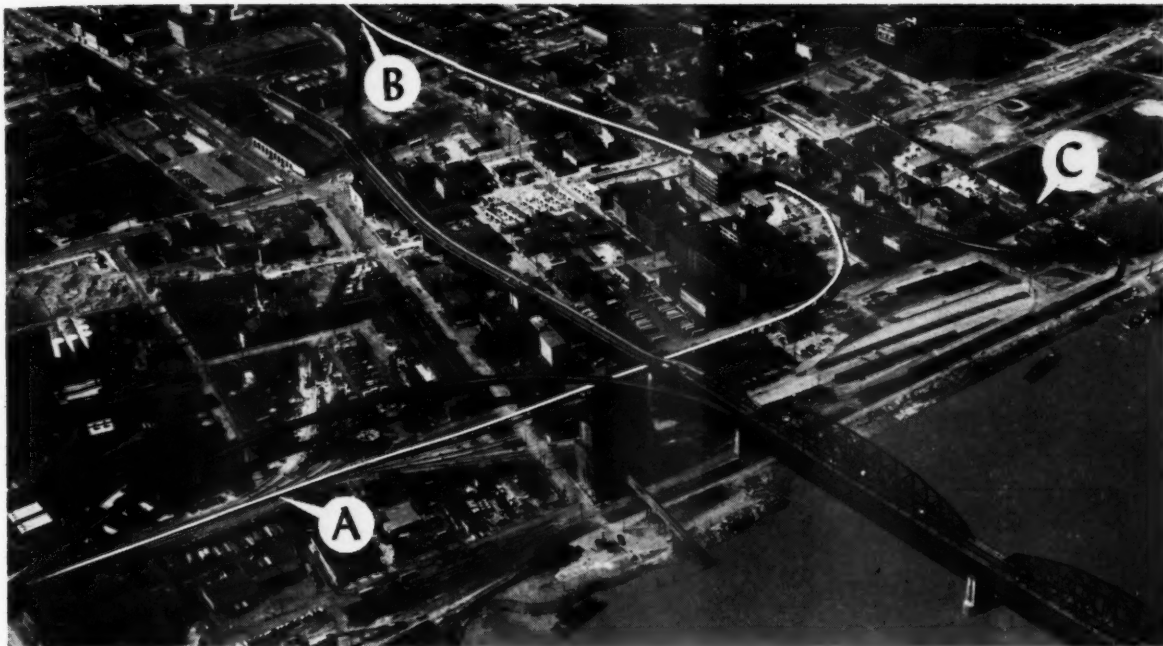
After the cofferdam had been anchored to the pier and dewatered, laborers entered and removed all disintegrated concrete to a clean hard surface. Any surface which was not eroded, but against which new concrete had to bond, was cleaned or scaled. After this, dowels or reinforcing bars were placed in the areas of deepest deterioration, and a second assembly of reinforcing was erected 6 in. inside the outside wall of the cofferdam. Only after this work had been completed, and the cofferdam had been welded into a single continuous unit, was the form ready for concrete.

During the period when this preliminary work was in progress, work was halted only two hours one morning because of high tide. On several occasions the area near the top of repair was contaminated by floating "gook." Because all work occurred "in the dry" this material was spotted immediately and removed.

To handle the concrete pour, four vertical chutes or hoppers built into the swing span dropped the concrete to the bottom chord of the swing span. From each hopper, inclined portable chutes carried the concrete to any desired part of the cofferdam form. This procedure allowed water traffic to pass when the locomotive crane was on shore. On shore, the concrete was dumped from ready-mix trucks into 1-yd. concrete buckets which were placed on a flat car by the locomotive crane. The crane pulled the car to the pier and unloaded the buckets directly into the vertical hoppers. Once pouring had started, the contractor and the Arundel-Brooks Company, ready-mix suppliers, kept the concrete coming uniformly, the only delays being due to train schedules. The concrete consisted of a 7.2-bag mix including Pozzolite and sufficient Daxex A.E.A. to entrain 4 to 6 per cent air. A low slump was specified to increase the structural strength of the concrete.

After the concrete had cured for seven days, the supporting cables and brackets for the cofferdam were removed and chipping of the deteriorated concrete on the upper section of the pier began. "Guniting" repair of this area completed restoration of the pier.

Engineers for the railroad were John T. Andrews, special engineer of maintenance, Gurney Dayett, Sr., then assistant engineer of bridges and now assistant to engineer bridges and buildings, who supervised design of the plans, and C. R. Riley, then division engineer and now engineer maintenance of way of the Eastern region, who was responsible for construction. I. Leon Glassgold supervised the engineering and construction work for the contractor.

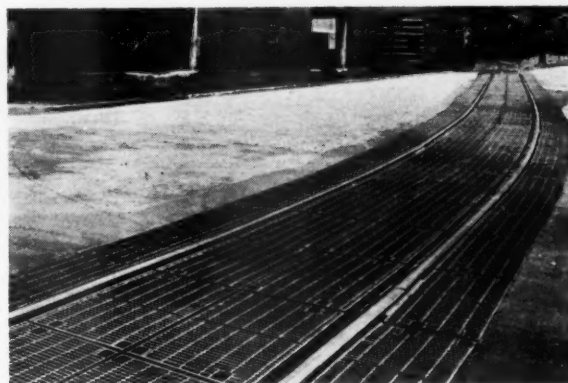


**ABOVE**—New highline built by the Missouri Pacific to eliminate street-level traffic at St. Louis between the Lesperance Street yard and the Twelfth Street yard. Starting at grade near First and Rutger street (out of view at left of A), the new concrete and steel trestle (emphasized in white) rises on a 1½-per cent grade, passing under the MacArthur bridge, and curves westward to parallel the track structure of the T.R.R.A. of St.L. From a connection (B) with the tracks approaching the MacArthur bridge, the line descends into the eastern end of Twelfth Street yard (out of view at top). Train in street (C) is an old Poplar Street route, now being removed. **RIGHT**—Piles for the highline were, for the most part, driven from the elevated level and, in some cases, were spliced to obtain sufficient penetration.

## News Briefs in Pictures...

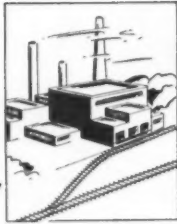


**BEFORE** improvement, the crossing at Plum Street of a siding leading to the Wooding-Verona Tool Works at Oakmont, Pa., was in the badly deteriorated condition shown here. The crossing, 168 ft. long, accommodates both vehicular and pedestrian traffic.



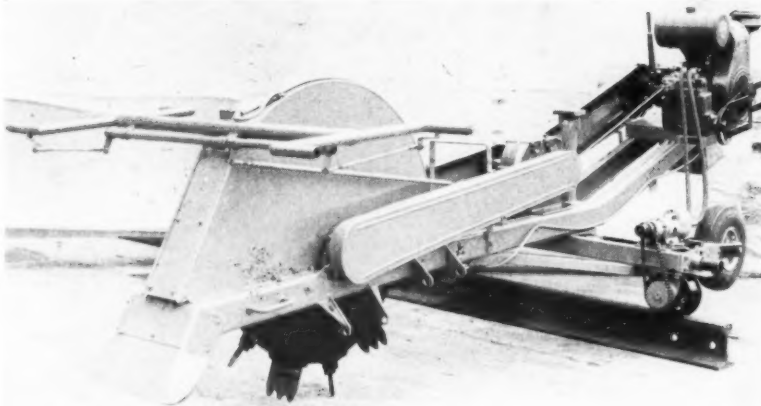
**AFTER** the installation of Blaw-Knox electroforged grating, the crossing presented this improved appearance. The grating is said to protect the ties by preventing rot caused by excessive moisture. Grating is also removable to permit tie tamping.





## PRODUCTS OF MANUFACTURERS . . .

. . . new, improved equipment, materials, devices



### CRIB REDUCER

A MACHINE designated the W89 Series A Crib Reducer has been developed by Fairmont Railway Motors, Inc., Fairmont, Minn., for use with rail gangs in digging out that part of the crib that might foul the bits of power adzers. The new machine consists of a balanced frame, mounted on double-flanged wheels, at one end of which is a digging drum, shielded for safety purposes, and at the other end a power plant.

The digging drum turns on self-aligning ball bearings and has renewable teeth of abrasion-resistant alloy steel. The maximum outside diameter of the drum with teeth is 41 in. The shield for the drum is pivoted within limits to permit the machine to be worked at grade crossings and adjacent to platforms.

Power is supplied by a single-cylinder, air-cooled engine fitted

with a power take-off, manual clutch, and hydraulic coupling. The drive includes a double V-belt to a reduction gear, and a double V-belt from the reduction gear to each side of the digging drum. An adjustable counterweight is provided to keep the machine in near balance.

The unit is propelled along the rail from crib to crib by hydraulic power, and the speed of the forward travel can be varied by a simple adjustment. Two pneumatic set-off wheels and self-storing lift pipes aid in removing or re-railing the unit. When necessary to dead-head the machine on both rails, one of the set-off wheels is moved to the digging side of the machine and located so as to ride the rail. A lifting post is also provided for handling by a rail crane. The machine can be worked in either direction.

### CRAWLER CRANE

PREVIOUSLY engaged only in the manufacture of truck-mounted rigs, Schield Bantam Company, Waverly, Iowa, has now expanded its line to include a completely new 1/2-yard, 5-ton crawler crane-shovel. Designated Model C-35 Bantam, this machine is available with interchangeable front-end attachments to enable it to serve as a crane, dragline, back hoe, shovel,

clamshell, magnet, wood grapple or a pile driver.

Among its engineering features are: A two-speed independent travel which enables the operator to work a front-end attachment while traveling and swinging the machine; an undercarriage designed with heavy-duty main frame and deep, rigid side rails; six track rollers which provide even distribution of load weight over

entire track assembly; drive power through chain and jaw clutches for each track; a "twin-swing" drive arrangement, plus fast-acting mechanical controls and jaw clutches, which are said to enable the operator to enter turns with split-second pause and return to straight-line travel without stopping; and low ground-bearing pressures with either of the two standard size pads available—5 psi. with 16-in. pads and 3 1/3 psi. with 24-in. pads.

Other features include: A power boom hoist which gives positive lowering as well as raising; full-revolving crane with 6 r.p.m. swing speed and 175 f.p.m. line speed; anti-friction bearings; machine-cut



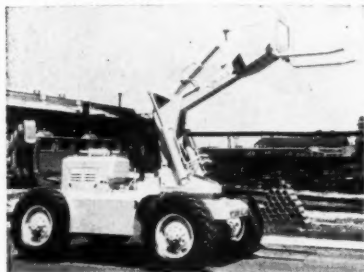
gears; internal expanding band type "snap-in" clutches; external contracting brakes; large-size trunnion base with four trunnion rollers; and four adjustable cam-type hook rollers.

### SWING LOADER

A NEW machine, designated the Model 422 Speed Swing Loader, has been developed by the Pettibone Mulliken Corporation, Chi-



cago. The unit is essentially a heavy truck chassis, mounted on four large pneumatic tires, which supports a hydraulically operated boom. Various boom attachments are available to enable the machine to serve as a track cleaner, a bucket loader, a fork lift, a tote crane, and as a snow remover. It is powered by a gasoline engine rated at 56 hp. at 2,000 r.p.m., has a four-



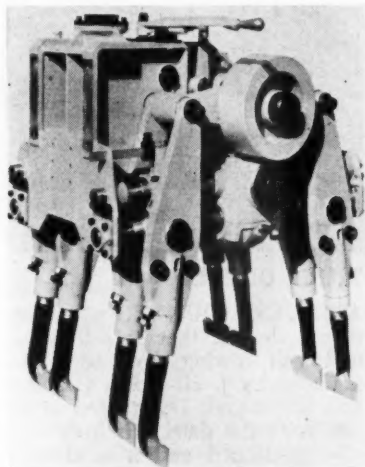
wheel drive, and is available with either the two or four-wheel steering.

It has an adjustable seat, a hydraulic booster steering, a parking brake, and a hand throttle. When equipped with a bucket it will handle from  $\frac{1}{4}$  to 1 cu. yd., raising its load to its maximum dumping height of 9 ft. 8 in. in 7 sec. The attachment can be swung through 180 deg. and can be tilted up 30 deg. The maximum static load is 6,000 lb. and it weighs approximately 7 tons. It has an overall width of 8 ft. 0 in.

#### IMPROVED TOOL CHASSIS ON MATISA TAMPERS

FOR ITS AUTOMATIC Tamping Machine, The Matisa Equipment Corporation, Chicago, has developed a new tamping-tool chassis which is said to increase the speed of tamping track, give the operator finger-tip control of the tamping tools, and reduce the cost of operation. The new chassis, designated type BB, has the same outline dimensions as its older counterpart and is thus interchangeable with the chassis of existing machines. On the other hand, the new unit differs from the old in three major respects: (1) Each new eccentric shaft and its eccentric have been combined into one piece instead of being made up of one shaft with double eccentrics on each end. In connection with this improvement, the eccentric bearings have been converted to the large spherical roller-bearing type with a tapered bore and bushings. This permits

adjustments to be made in the bearing clearances. (2) The double clutch has been redesigned so as to provide finger-tip control of the opening and closing of the tamping tools. This is said to decrease operator fatigue and increase the quality of the work. Alterations have also been made to the gears so that the tamping tools can be opened in the same time interval during which the tool chassis is raised, thereby speeding up the



tamping operation. (3) The triple-chain drive has been eliminated. This has been accomplished by driving both spindles through a worm gear on each spindle thus eliminating the triple-chain drive of one spindle, as used on present models of the Matisa tamper.

In addition to these major improvements incorporated in the new "mobile" chassis, the strength of all parts having high mechanical stresses has been increased and special clutch linings have been installed.

#### TEN-TON CAPACITY CRAWLER SHOVEL

A NEWLY DESIGNED crawler-mounted excavator is presently being produced by the Koehring Southern Company, subsidiary of the Koehring Company of Milwaukee, Wis. Included among the major improvements incorporated in the new excavator, which is rated at  $\frac{1}{2}$  cu. yd. dipper capacity for shovel and hoe, is a simplified upper machinery arrangement that involves only two horizontal shafts. The manufacturer claims that the increase in lift capacity rating from the former Model 205 of 7½-ton to 10-ton in this, the redesigned

Model 205, can be attributed principally to changes in engineering design whereby the upper machinery was relocated behind the excavator's center of rotation.

Other improvements made in the new model include fully enclosed gears, automatic brakes, a new cab design and operating lever arrangement, adjustable hook rollers and an electric dipper trip arrangement. The four individual hook and turntable rollers are mounted on non-metallic bushings and each is adjustable for wear by means of an eccentric. The improved dipper trip arrangement operates off an electric solenoid with button control located on one of the operating levers.



Other standard Koehring features incorporated in the new Model 205 include: self-cleaning crawlers with interchangeable shoe widths of 16 in., 20 in., and 24 in.; all-welded car body bolted to axles; single, internal expanding and reversible band clutches; a positive boom lowering device; choice of diesel, gasoline or electric power; and full convertibility from shovel to hoe, crane dragline, clamshell or magnet attachments.

#### HEAVY DUTY VACUUM CLEANER

PRODUCTION of a new heavy-duty portable vacuum cleaner for maintenance use in industrial plants, commercial buildings, railway cars, and similar applications has been announced by the Premier Company, St. Paul, Minn. Designated as Model P-909, the new cleaner is equipped with a universal type a-c/d-c 115-volt motor, sealed against water damage and fitted with a separate cooling system for continuous operation. It generates an air flow of 74 cu. ft. per min. and a vacuum water lift of 42 in.

Dry tank capacity of the unit is (Continued on next page)

1½ pecks and its liquid capacity is 3½ gal. All bearings are of the precision ball-type, permanently sealed in lubricant. The unit is mounted on four rubber tread casters and it is equipped with a protective rubber bumper which surrounds the cleaner base. A number of standard cleaning tool attachments are furnished with the unit, including an 8-ft. braided rubber hose with adapter, steel floor rod for connecting tools to the hose, floor and rug nozzle, bare floor and wall brush, crevice tool, utility and upholstery nozzle and a slide-on brush. Also available from the manufacturer is a kit of tools for conversion of the machine to wet-pickup equipment.

### IMPROVED EXCAVATOR

THE PIPPEN Construction Equipment, Inc., White River Junction, Vt., announces a completely re-engineered model of the tractor-powered, hydraulic Pippin excavator. The new model, designated Deluxe Model WF-104, is said to be more sturdy and powerful than previous models. It attaches to light tractors, such as Ford or Ferguson, and is being adapted to other makes of tractors. It will excavate over 10 ft. deep and will lift to a height of 12 ft. for truck loading. Its wider swing (12.5 ft. from center) al-



lows the piling of dirt farther from the excavation.

Besides heavier construction throughout, the power of the bucket is increased through hydraulics and leverage. The excavator is rigidly supported by its two hydraulic stabilizers, which relieves the tractor of the working stresses and assures digging of plumb ditches on uneven ground or on slopes up to 15 deg. A hydraulic tank of greater capacity provides better oil cooling under extreme working conditions. A wide variety of buckets, back-hoes and shovels increases the excavator's usefulness.



### TRUCK DERRICK

A TRUCK-MOUNTED power-operated derrick that is self-raising and self-stowing has been announced by J. H. Holan Corporation, Cleveland. Designated as Series 3100, the derrick is hydraulically positioned and it is claimed that it can be set up for work or stowed away by one man in 2 or 3 min. It is designed to be permanently mounted on top of a utility body, yet it leaves working and loading space within the body clear and with ample head room.

The side legs of the new derrick are secured in heavy swivel bearings on top of channel sections at the rear of the body. Each has a sprocket geared to a heavy chain which is driven by a powerful hydraulic cylinder to swing the derrick up into working position or back into its overhead stow position.

The hydraulic system is controlled by two levers conveniently located just above the rear platform, on the right side of the body. The hydraulic cylinders are used only to swing the derrick in or out, and do not take any of the lift load, which is transferred directly to the truck frame by the heavy channel supports.

The adjustable center leg, with sheave, is permanently assembled with the side legs and requires no dismantling when not in use. When fastened to the footplate on the rear platform, or used with a special ground plate as a "stiffleg," it can be adjusted to several lengths.

Working capacity of the derrick is from 3,000 lb. fully extended to 7,000 lb. in the short-reach position. With the third leg on the ground a 10,000-lb. straight pull can be exerted.

### HY-RAIL MOTOR CAR

A NEW model of the Hy-Rail motor car, designated as A32 Series A, has been announced by Fairmont Railway Motors, Inc., Fairmont, Minn. This unit is designed expressly for railroad maintenance service. As built, the motor car includes a chassis and a pick-up body applied behind an enclosed cab. It has a four-cylinder engine, three-speed transmission, with under-drive in transfer case, four-wheel drive, hydraulic brakes, 7:00 by 15:00 pneumatic tires, and a 1500-lb. load capacity. Body styles other than the pick-up type are under consideration.

The on-track mechanism is similar to that furnished on other Fairmont Hy-Rail motor cars in that non-load-bearing guide wheels are



used. Normally, all of the vertical load is carried on the pneumatic tires and the guide wheels serve

only to position the unit on the track. However, they are strong enough to carry the full vehicle load in an emergency.

The mounting and linkage of the guide wheels are such that, when the wheels are in the lowered or on-track position, any condition that might tend to raise them must lift that portion of the total vehicle weight carried by the adjacent pneumatic tires. The guide wheels are raised and lowered manually, and have a pin lock to hold them in the lowered position and a spring-loaded, rubber-cushioned catch to secure them when raised.

## PARTS CLEANER

A NEW air-operated "jet action" parts cleaner, said to greatly reduce the time required for cleaning carburetors, fuel pumps, pistons, brake shoes, and other machine and automotive parts, has been announced by Franklin Associates, San Pedro, Cal. Called the Jiffy Parts Cleaner, the device uses compressed air at any available pressure above 45 psi to create a turbulence which is said to produce an effective mechanical cleansing action to the detergent properties of any commonly used solvent. The manufacturer claims that dirty carburetors and other grease-coated parts can thus be thoroughly cleaned within five minutes, with greater penetration of crevices, grooves, and threaded holes.

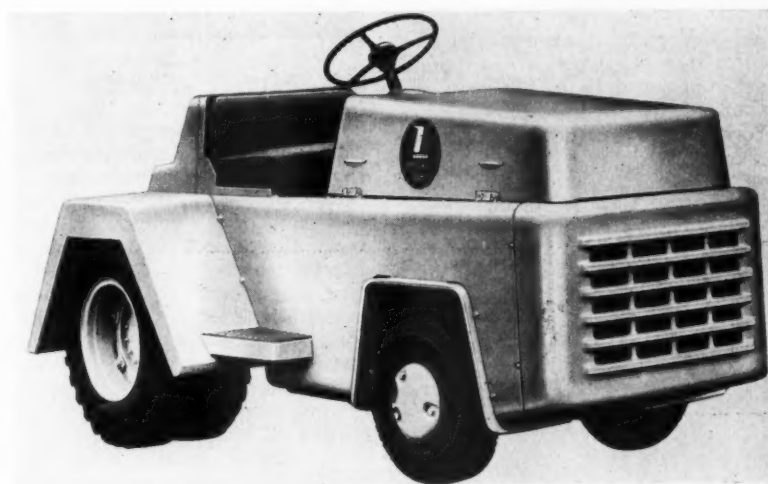
The heart of the parts cleaner is a five-jet agitator unit with 12 ports which admit compressed air in such a way as to set up a turbulence pattern which activates the entire volume of solvent in the tank. This unit is housed in a heavy steel tank of 6½ gal. capacity. A heavy-duty parts basket, equipped with a locking hook which grips the lip of the tank, provides easy loading and draining of cleaned parts. After the basket is loaded, the locking hook is released and the basket is lowered into position over the agitator unit. A friction-grip splash lid seals the tank to prevent spilling of the solvent. An air-valve outside the tank admits compressed air to start the cleaning action, and a turn of the same valve cuts off the air-flow when cleaning is completed. Because of this arrangement, the Jiffy can be used for overnight soaking without air agitation, or for fast cleaning with air agitation.



## IMPROVED SLOT GRINDER

TELEWELD, INC., Chicago, has announced the development of an improved model of its rail-slotting grinder. The new unit has been redesigned making it a lightweight self-contained machine of 70 lb.,

which is half the weight of the previous model. The design retains the wheelbarrow type of rubber-tired wheel for moving it between the joints to be beveled or slotted to prevent rail-end chipping. The manufacturer states that the improved machine is capable of slotting 15,000 joints without overhaul.



## WHEELED TRACTOR

A NEW tractor, designated the Model TC-60 "Payloador," has been placed on the market by the Frank G. Hough Company, Libertyville, Ill. Mounted on pneumatic tires, this tractor has a drawbar pull of 6,000 lb. but is very compact—being less than 5 ft. high and 10 ft. long—and has a turning radius of 10 ft. 1 in.

Among the features cited for this

new unit are: Easy maneuverability; a torque-converter drive coupled to a full-reversing two-range transmission; a forward speed range from 1.6 to 16.9 m.p.h. and a reverse speed range from 1.8 to 19.0 m.p.h.; 6-cyl. 67-hp. gasoline engine; low center of gravity; smooth torque-converter pull at all stages of travel; no clutch maintenance; and fullest operator visibility.

(Please turn to next page)



## CHAIN SAW

A NEW Homelite Model 5-30 chain saw, produced by Homelite Corporation, Port Chester, N.Y., is said to incorporate exceptional power, faster cutting, light weight and low maintenance as outstanding features. Weighing 30 lb., the chain saw is powered by a 5.5-hp. gasoline engine which, the manufacturer states, enables it to bring down timber 4 ft. or 5 ft. in diame-

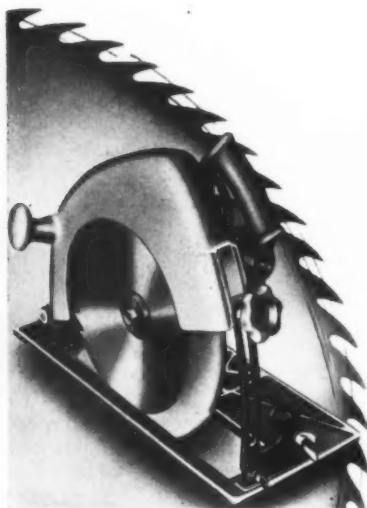


ter quickly and to cut through a tree 20 in. in diameter in as little as 20 sec.

It is claimed that the new chain saw, because of its light and correctly balanced weight, is easy to handle and cuts in any position—up, down, or upside down—for felling, bucking, boring, notching, trimming or undercutting operations. In addition to its all-angle carburetion, the new saw has automatic clutch and positive chain lubrication.

## AIR SAW

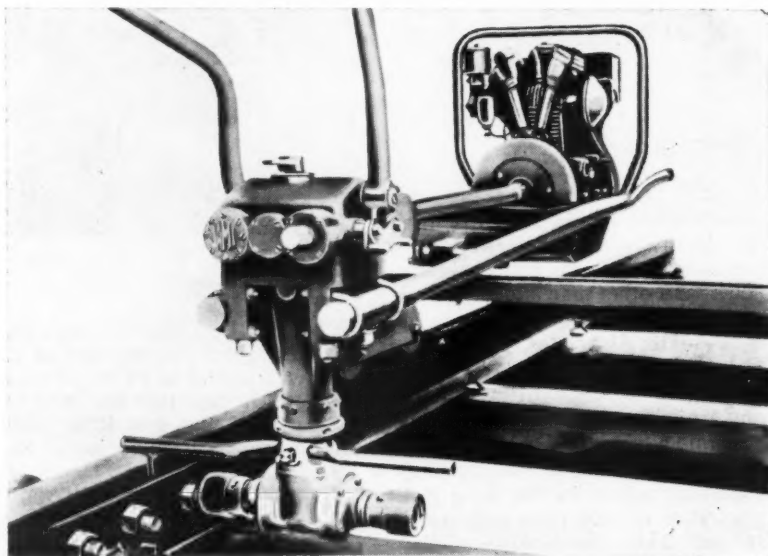
A NEW portable air-powered circular saw, having a maximum depth of cut of 4½ in., has been announced by Ingersoll-Rand, New York. Designated the S-12 Air Saw,



the new unit is powered by the same Multi-Vane air motor as used in other air tools of this company, and is designed for use on 90-psi

air pressure. The saw blade is driven through a simple spur gear drive, the design of which reduces the arbor length between the motor and the saw blade.

The motor and blade housings, base, blade guard, and handles are of cast aluminum to assure light weight and durability. The liberal use of ball bearings and a convenient and efficient lubrication system are said to assure long trouble-free service.



## NEW POWER WRENCH

THE MATISA Equipment Corporation, Chicago, has announced that it is introducing to the railways of the United States, Canada, and Mexico, a power wrench presently in use throughout Western Europe. Powered by a 3½-h.p. gasoline engine, the portable Matisa Power Wrench incorporates an adjustable spring-loaded disc clutch which affords a means of varying and automatically applying a predetermined constant torque to the nuts of all bolts tightened.

The chassis is of tubular steel construction and carries the power unit and wrench-head mounted separately at either end. One of the two handles provided at the wrench-head end of the chassis for transporting and maneuvering the machine also constitutes the control lever of the disc clutch.

The chassis is mounted on a light axle in such a way that vertical movement of the head and rotation about a vertical axis may take place. The tubular steel axle is supported at one end in a small two-wheeled

The depth and angle of the cut are readily changed by simple adjustments of a hand screw and thumb screw. The maximum thickness of material cut when the saw is set for a 45-deg. bevel cut is 2½ in. Another important feature cited is a design of maximum safety—the throttle lever is located on the inside of the grip handle and the saw blade is enclosed by a housing on top and a telescoping guard underneath.

trolley and by an insulated roller at the other end, both wheels and roller being flanged to fit on the rails. It may be slung from underneath the chassis when transporting the machine by hand.

The wrench-head houses, in addition to the wrench spindle, a multi-disc clutch, and reduction and reverse-direction gearing. Power is transmitted from the engine through a torque rod and disc clutch to a horizontal shaft in the wrench-head. Two bevel pinions rotate freely on this shaft in constant mesh with a crown wheel keyed to the vertical wrench spindle. Either pinion may be engaged to transmit the drive from the horizontal shaft to the wrench spindle by means of a dog clutch sliding on the shaft between the two pinions. The direction of rotation of the wrench spindle is thus determined by the pinion transmitting the drive.

The right handle of the machine also forms the control lever of the multi-disc clutch. The handle's movement is limited by an adjustable spring-loaded stop which, for



any one setting, assures the application of equal torque to all bolts. If necessary, the stop may be removed and the clutch pressure increased by depressing the hand lever still farther to provide the greatly increased torque which is often required when removing old nuts. The clutch-control lever may be locked in position when using it as a handle for transporting the machine.

A spring-loaded universal joint is provided between the wrench spindle and the spanner-head so that when working, the machine is always upright and balanced on its support. The whole mechanism works in an oil bath, and periodic changing of the oil is said to be the only maintenance required by the wrench-head.

### ULTRASONIC TESTING DEVICE

THE EXCLUSIVE right to manufacture and sell an improved ultrasonic testing device, known as the Soni-rail, has recently been granted to Teleweld, Inc., Chicago. This equipment, developed in France, is carried by one man and is said to be particularly adapted for detecting web defects in the joint-bar area.

When testing, either water or oil is used as a wetting agent to provide good contact between the rail and the search unit. Normal rail

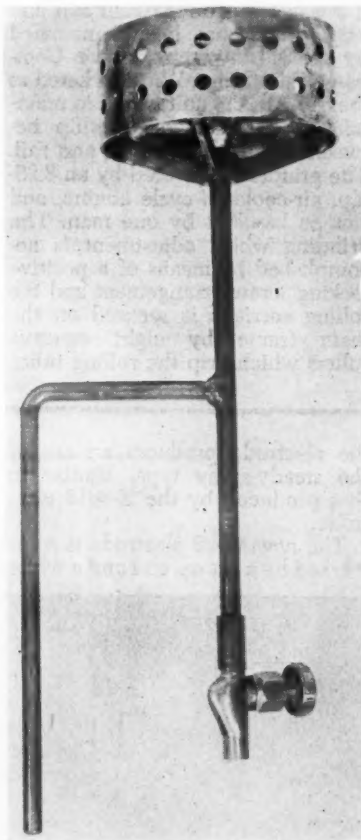


produces a tone of about 1000 cycles per second, and a web defect,  $\frac{1}{8}$  in. long, will change the tone to about 400 cycles. Although headphones may be used, they are not necessary as the equipment

contains a built in loudspeaker and also there is an output meter, visible to the operator, which responds to changes in tone. Hence, the operator has both a visual and an audible check for defects. Adjustments can be made at the factory for reducing the sensitivity of the equipment to a pre-selected point so that minor defects are not detected.

### ACETYLENE FLARE

FOR EMERGENCY night-time lighting, the Air Reduction Sales Company, division of Air Reduction Company, Inc., New York, has marketed a simple but rugged gas-operated unit, termed the Airco Acetylene Flare. This new flare, us-



ing acetylene gas as a fuel, provides a practical and convenient means of obtaining a large amount of illumination on and around a work area. It provides a full 360-deg. of light around itself. The flare is of all-welded construction and incorporates a sturdy wind shield a standard acetylene gas valve, and a  $\frac{3}{8}$ -in. dia. steel rod to facilitate mounting.

### ONE-MAN CHAIN SAW

A ONE-MAN chain saw designed for high-speed cutting in construction and land-clearing work has been introduced by the McCulloch Motors Corporation, Los Angeles, Calif. The new Model 4-30 is said to have ample power to cut rapidly through timber up to 5 ft. in diameter, yet its lightweight and balance are said to make it easy to use and fast for cut-off work in any position for land clearing, timber ripping, and general woodcutting. The manufacturer claims more than four brake horsepower for its new



The new McCulloch Model 4-30 chain saw

model. The 4-30 weighs 30 lbs. complete with a 14-in. chrome-plated blade and chain. Available blades range up to 36 in. in length. A 15-in. bow attachment is also available.

An aircraft type carburetor, combined with an all-position fuel system, is said to enable the Model 4-30 to operate at full power in all positions, without carburetor adjustment of any kind. The manufacturer claims that weight distributed in relation to the blade makes felling, bucking, and limbing, as well as carrying, more convenient for the operator. Other features of the new McCulloch saw include an automatic clutch, automatic-rewind starter, large fuel capacity, positive chain oiler, high-speed "Sabertooth" chain, and grouped engine controls.

### STATION PAINT

A LINE of high-gloss, chalk-resistant, exterior finishes has been developed by E. I. DuPont de Nemours & Co., Wilmington, Del., for application to railway stations, tool houses, and freight stations. It is claimed that tests conducted on stations over a period of one to three years in various locations demon-

(Continued on next page)

strate the superior gloss retention of the new synthetic over finishes now in use. The new "Dulux" Railway Station finishes are said to have a decidedly lower chalk rate than standard oil-base paints so that the possibility of chalk pick-up by passengers' clothes is minimized.

The "Dulux" Railway Station finishes may be brushed or sprayed and have a spreading rate of 500 to 600 sq. ft. per gal. It is claimed that these finishes dry to the touch in 2 or 3 hr. and may be recoated after an overnight dry. In addition to normal wood surfaces, they may also be applied over metal, cinder-block, cement and brick when a suitable primer is employed.

### IMPROVED STUD DRIVER

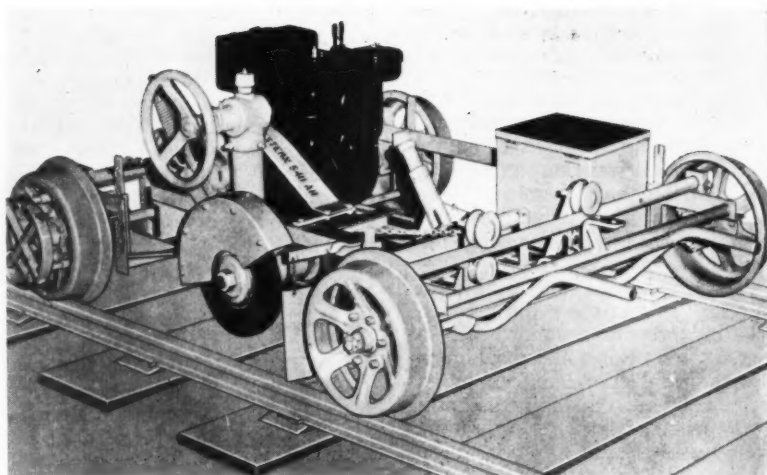
A PERMANENTLY attached spall or protective shield for the Velocity-Power Driver has been announced by the Velocity Power Tool Company, Pittsburgh, Pa., as



being an improved design feature of this cartridge-actuated tool for setting studs in concrete or steel. For close-to-the-wall jobs a section of the spall shield may be lifted and turned out of the way.

### WELDING ELECTRODE

DESIGNED for build-up work and hard-surfacing applications wherein the deposited metal can be machined or flame hardened, a new welding electrode recently announced by the General Electric Company's welding department is a heavy-covered flame-hardening rod that can be used in all positions. Designated G-E Type W-98,



### RAIL AND FROG GRINDER

A NEW LIGHTWEIGHT rail and frog grinder has been announced by the Northwestern Motor Company, Eau Claire, Wis. Marketed as the 540-AB, the unit is said to maintain an accurate relationship between the grinding wheel and rail. The grinder is powered by an 8.25-h.p. air-cooled 4-cycle engine, and can be handled by one man. The grinding wheel adjustment is accomplished by means of a positive locking screw arrangement and the rolling carriage is secured on the main frame by eight concave rollers which grip the rolling tubes

top and bottom to reduce vibration. Optional equipment are the flexible shaft and grinding attachments used for such operations as slotting rails between joints; removing overflow metal caused by battering of heavy traffic on the joints; and removing excess metal when joints are built up by welding. The 9-ft. flexible shaft is a standard Haskins shaft and will accommodate any of the standard grinding attachments offered by them. This shaft is powered by "V" belts from the engine pulley. Rail skids and extension lift handles are provided to make the 540-AB easier to handle when moving it on or off the track.

the electrode produces an arc of the steady-spray type, similar to that produced by the E-6013 electrode.

The new W-98 electrode is color marked by a brown end and a white



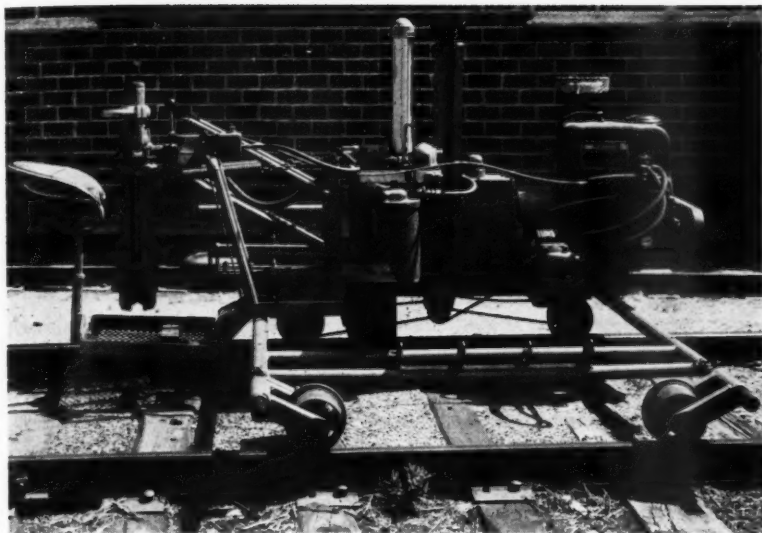
spot. It utilizes alternating or direct current, and is manufactured in  $\frac{1}{8}$ -in. and  $\frac{1}{4}$ -in. sizes. It is recommended where a higher hardness deposit is desired than that obtainable with electrodes used for under layers. It can be used in build-up applications to work

equipment, parts, gears, pinion teeth, pump housings, shafts, and sprockets. Although the type of material involved and the welding conditions can greatly affect the hardness of the deposited metal, generally the hardness of the W-98 electrode deposit will be approximately 250 Brinell as welded and it will flame harden to about 350 Brinell.

### SPIKE PULLER

A HEAVY-DUTY, high-capacity hydraulic spike puller, designated Model W85 Series A, has just been announced by Fairmont Railway Motors, Inc., Fairmont, Minn. Designed for rail-gang use, it can be operated by one man, and is self-propelled, both forward and reverse.

The pulling assembly, controls, and operator's platform and seat are easily positioned for pulling spikes from either side of the rail; but once positioned, the pulling is done from only one side for each



setting. In operation, one machine pulls the spikes from one side of the rail, and a second machine pulls those from the other side. Hence the machines work in pairs or multiples of two. Each machine has a capacity of from 20 to 25 spikes a minute, depending on the skill and experience of the operator, and two machines are said to be able to handle the needs of an average gang of 75 men.

The spike puller is powered by a two-cylinder air-cooled engine. The hydraulic system for pulling the spikes includes a direct-driven pump, reservoir, micro filter, unloading valve, control valve, piston-

type accumulator, and the pulling cylinder. The cylinder is mounted on a spring counterbalanced pantograph frame for easy raising and lowering. The unit is propelled along the track by hydraulic power.

The operator raises and lowers the pulling assembly with his left hand, and controls the movement of the machine along the track with his right. A foot pedal is used to actuate the pulling cylinder control valve. The frame is fitted with a lifting post to permit handling with a rail crane. Set-off equipment, consisting of two pneumatic set-off wheels and self-storing lift pipes, is also available.



### SAND DRYER

A NEW, highly portable drying machine, designated the Dryall, has been announced by Barber-Greene Company, Aurora, Ill. With a capacity of 8 tons per hour, the

Dryall has a rotating drum of heavy gauge metal which is charged by a power-operated skip having a capacity of 3 cu. ft. In receiving position, the skip's upper edge is only 14 in. above ground level, permit-

ting hand charging by wheelbarrow.

In the drying drum, the material is lifted by a series of metal flights, which are attached to the drum's interior. This action drops the material repeatedly through a blast of hot gas and flame provided by an oil burner. A fuel tank with a capacity for several hours' operation is mounted on the machine's frame.

The Dryall is powered by an air-cooled gasoline engine. It is mounted on a rubber-tired chassis and can be towed about by a light pick-up truck. A simple and efficient hydraulic jackleg support assists in hitching and unhitching the machine and supports it during operation.

### FRICTION CAR STOPS

PERMASCO, division of Winter, Wolff & Co., Inc., New York, has marketed a friction car stop designated the Permasco Stop Shoe Skate. As its name implies, it is for



progressively stopping the motion of cars in switch yards and on spur tracks. It is of simple forged steel design and is light enough to be carried easily by one man.

The sole part of the Stop Shoe Skate, because it absorbs the greater part of the shock, is made of nickel-chrome steel and is given a thorough heat treatment so that the front end has greater tensile strength than the back end. The devices are available in three sizes—for rail sections from 60-lb. to 80-lb., inclusive; for 85-lb. and 90-lb. sections; and for 100-lb. rails. Shoes for larger or smaller rail sections can be secured on special order.

### TRENCH HOE EXCAVATOR BOOM

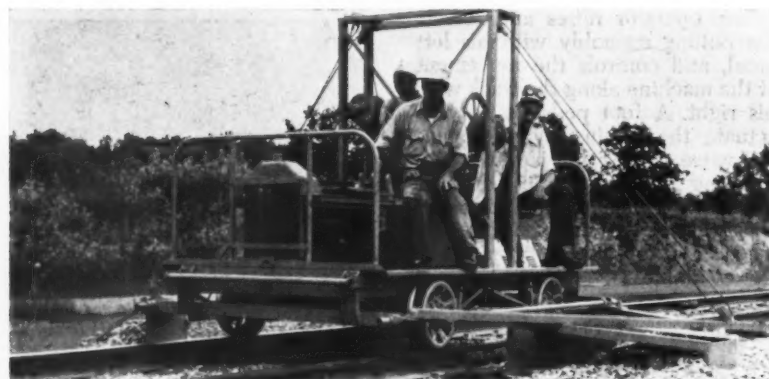
AN OPTIONAL heavy-duty trench-  
(Continued on next page)





hoe boom has been made available by Gar Wood Industries, Inc., Findlay division, Findlay, Ohio, for use with the Gar Wood 75 Series excavators. The new boom, which weighs 8500 lb., is designed for extra rugged excavation, cross-country pipeline work and other ex-

treme operations. As is the standard trench-hoe boom, the heavy-duty boom can be removed for conversion to shovel, crane, dragline, clamshell, pile driver and foundation-borer attachments on the Gar Wood 75A, the heavy-duty 75B and the 75BT truck crane.



### BALLAST SCARIFIER—SHAPER—TRACK DRESSER

THE KALAMAZOO Manufacturing Company, Kalamazoo, Mich., has recently made available the Kalamazoo Model 38B Ballast Scarifier, Shaper and Track Dresser. The unit is adaptable to the standard Kalamazoo motor car chassis and is equipped with a Ford Model 120, 50-hp., 4-cylinder water-cooled engine. A standard Ford clutch and selective speed transmission is employed together with the Kalamazoo reverse transmission which allows equal speeds in either direction.

The scarifier-shaper arrangement consists of a box which picks up, levels and shapes the ballast in the intertrack space. On the opposite side of the machine is located the track dressing unit which is designed to regulate the slope and dis-

tribute the ballast evenly on the shoulder. Both assemblies are adjustable to allow the unit to be adapted to various conditions of track, as required. The unit, which is equipped with four-wheel drive, is intended to be used after the track has been raised and after tamping machines have finished their work.

### NEW ELECTRIC POWER PLANT

THE FIRST of a series of new electric plants has been announced by the Kohler Company, Kohler, Wis. The new model is specially designed for various portable and semi-portable jobs requiring electric power generated at the site. Generating 1000 watts, the new plant is designated as Model 1A21.

It is automatic, starting when any lamp bulb (40 watts or larger), appliance or motor connected to the plant is turned on. The new Kohler plant automatically stops when all loads are cut off. The 1A21 will operate forty 25-watt bulbs at one time, or appliances such as fans, water systems, and various types of power tools. The new plant is available in the automatic model, a port-

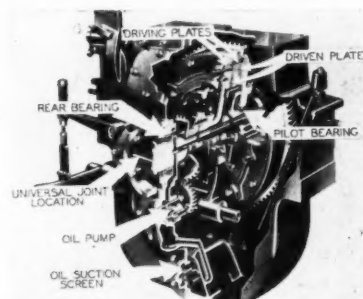


The new Kohler Model 1A21 electric plant

able model and a push-button model. All are available for either gasoline or natural gas operation. They are said to be designed for quicker, easier starts.

### TRACTOR CLUTCH

AN OIL-TYPE flywheel clutch has been introduced by Caterpillar Tractor Co., Peoria Ill., as standard equipment on its D8 and D6



tractors and its Caterpillar No. 6 shovel. This clutch is considered a major development by Caterpillar because it is claimed that it will operate two to four times longer than an equivalent dry clutch before major adjustment or overhaul is necessary. It is intended that with this clutch the overhaul period will coincide with the normal overhaul of the engine.

When the new clutch is being engaged, the oil absorbs the entire load up until the last few revolutions before full engagement, at

which time the friction faces finally come into direct contact. This feature is said to assure longer wear. In operation, the oil within the

clutch housing provides constant lubrication for the cams, bearings and internal linkage, as well as acting as a cooling agent.



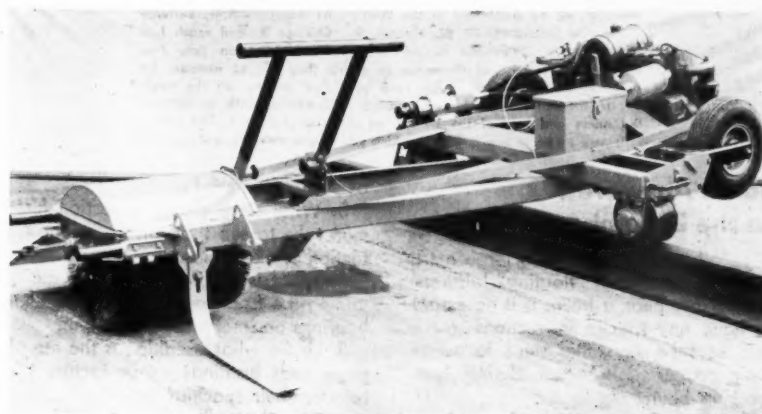
#### IMPROVED GANG CAR

AN IMPROVED large gang car, designated the A7 Series B, has been announced by Fairmont Railway Motors, Inc., Fairmont, Minn. The outstanding features of this unit are the heavy-duty directional gear and a 2 $\frac{3}{16}$ -in. drive axle. These are said to make this car particularly suited to continual heavy-duty work such as towing weed burners, and many loaded push cars or trailers. It is also strong and powerful enough for the mounting of ballast-discing attachments.

Standard equipment includes vacuum service brakes, oil bath air

cleaner, oil filter, electric starter, and extension lift pipes. Also available, in addition to the regular gang-car accessories, are a built-in hydraulic turntable, chain and sprocket four-wheel drive, and trailer connections for the vacuum brakes.

The heavy-duty enclosed directional gear on the drive axle has straight spur gears for reversing the direction of travel, and a pinion-and-ring gear for the final drive to the axle. Power is supplied by a Ford V-8 engine and the drive includes a clutch, four-speed transmission, and a needle-bearing propeller shaft.



#### TIE BRUSH

FAIRMONT Railway Motors, Inc., Fairmont, Minn., has announced a

new machine, designated the Model W88 Series A Tie Brush, for use by rail gangs for sweeping the ties ahead of power adzers. The

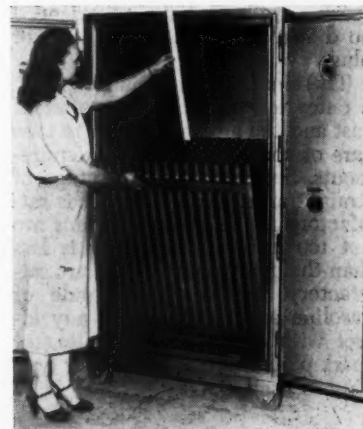
wire-brush wheel turns on self-aligning ball bearings, and is driven by a single-cylinder, air-cooled engine through a reversible reduction-gear clutch and a drive shaft having heavy-duty universal joints. The brush is 20 in. long and 15 in. in diameter, and is shielded by a safety hood and rock guard.

Hydraulic power is used to propel the unit at a suitable working speed, which can be varied merely by changing the setting of a bypass valve at the pump. Normally, the brush just clears the ties, being held up by a spring in the skid that slides along the ties. In use, the operator bears down on the handle and causes the brush to contact the ties.

The machine can be worked in either direction because the brush drive, propelling drive, and operator's handle are all reversible. Two pneumatic set-off wheels aid in removing the unit from the track or in re-railing it. When necessary to deadhead the machine on both rails, provision is made for applying one of the set-off wheels to the brush side where it rides on the ball of the rail.

#### TUBE-TYPE MAP STORAGE FILE

THE Scott-Rice Company, Tulsa, Okla., has made available to the railroad industry their line of Tube-files, for the storage of maps, drawings, tracings, and similar items.



The Tubefile is available in two sizes, one accommodating 56 tubes, and the other 112. The tubes are contained in a hinged metal rack in a vertical position. The units are enclosed in metal cabinets, fitted with a storage shelf, and are available in either olive green or gray.



# WHAT'S THE ANSWER?...

... a forum on track, bridge, building and water service problems

## Fuel-Lubricating Two-Cycle Engines

What are the relative advantages and disadvantages of detergent oil and straight mineral oil when mixed with gasoline to lubricate two-cycle engines employed on roadway machines? What effects, if any, do each of these types of oils have on the fouling of spark-plug points? Explain.

### A Matter of Cost

By RAY MCBRIAN  
Engineer Standards and Research,  
Denver & Rio Grande Western,  
Denver, Colo.

Insofar as our experience is concerned we use both a detergent and a straight mineral oil, mixed with gasoline to lubricate two-cycle engines in roadway machines. Use of the detergent oil is for certain specified load requirements and, of course, the use of straight mineral oil is in effect a matter of economy.

We have not found that either one of these oils has any effect on the fouling of spark plugs but the proper plug should be selected for the heat range. In our service we have not had trouble for the reason that we use the Type H-10 spark plug and have experienced no difficulties in using this type of plug.

Therefore, the question of using a detergent oil is first a matter of cost and the advantages are to take care of special heavy-duty requirements. Secondly, the advantage of straight mineral oil is that it is satisfactory if the load conditions are not too heavy, as the cost is less than the detergent oil. Both are satisfactory with a good grade of gasoline and neither have any effect with regard to the fouling of spark plug points if the proper type plug is used.

### Mineral Oil O.K.

By S. H. KNIGHT  
Supervisor of Work Equipment,  
Northern Pacific, St. Paul, Minn.

A number of factors are involved. Much depends, of course, upon whether you are talking

about non-leaded clear gasoline or leaded gasoline and what the content of lead amounts to.

Also entering into the discussion is the engine design, the type of service and, I would assume, the additive used. The writer has had no recent experience with the use of non-leaded gasoline in two-cycle engines. We use only first structure leaded gasoline in our two-cycle engines, mixing this with a detergent oil. We find this combination unsatisfactory, which seems to be in accord with information given us by the spark plug manufacturers, motor car manufacturers and makers of outboard engines.

Prior to 1951 we used a straight mineral oil of "premium" grade. During the past two years we have used a detergent oil and have experienced an increase in two-cycle

engine troubles apparently due, in part at least, to the additive in the oil which has resulted in increased ring sticking, increased build-up of deposit around exhaust ports and a substantial increase in spark-plug troubles due to a build-up of lead deposit on the inner porcelain terminal resulting in shorting or shunting of the plug due primarily to the use of leaded gasoline. Analysis of the deposit material indicates that it is approximately 90 per cent lead which, of course, comes from the gasoline, but the medium by which the deposit takes place apparently is the additive in the lubricating oil.

The writer does not profess to know how or by what chemical process the deposit is laid down. Much has been written on the subject of lead deposit formation and it seems to be the opinion of those most qualified to speak that the additive in the oil is a contributing factor. This has been borne out by tests on this railroad not yet completed where the use of a non-additive straight mineral oil has resulted in improvement by lessening the trouble from deposit on piston rings and exhaust ports and has eliminated spark plug trouble.

Answers to the following questions are solicited from readers. They should be addressed to the *What's the Answer* editor, Railway Track and Structures, 79 W. Monroe St., Chicago 3, and reach him at least five (5) weeks in advance of the publication date (the first of the month) of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

### To Be Answered In the December Issue

1. When camp cars of a large extra gang, comprised of "floating" laborers, are set out near a town, is it necessary to issue any special instructions to the men or take any other steps to assure their proper deportment during non-working hours?

2. What improvements have been made in the design of rooms or buildings for storing ice to be used on passenger trains? What modern materials are applicable in the construction

of such facilities? Explain.

3. What steps should a section foreman take to see that farm gates on his section are kept closed?

4. What is the best means for maintaining the free movement of expansion bearings on steel bridges? Explain.

5. Under what condition is the use of gage rods justified? What factors determine their spacing? Explain.

6. Should the screens of water intakes from reservoirs, lakes or rivers be cleaned at regular intervals? If not, how is it determined when an intake needs cleaning? Explain.



# Fire Hazards in Bridge Repair

What precautions should be observed to minimize the hazards of fire occurring from the use of oxyacetylene cutting torches in the repair of steel bridges? Explain.

## Follow the Rules

By R. W. TORBERT

Manager M/W and Construction Department, Oxweld Railroad Service Company, Chicago

The use of the oxy acetylene cutting torches in the repair of steel bridges should present no hazards if the recommended practices of the manufacturers in their use are followed.

The first requisite, of course, is to use proper equipment. This includes the regulators, connections, hose, hose fittings and the blow-pipe itself. Each of these items should be tested to determine that no leaks exist and that they are operating properly. The safety rule booklets furnished by equipment manufacturers fully cover the method of setting up equipment for operation.

Second in importance is that the operators be qualified in the operation of the equipment. The hazards usually attributed to the use of cutting equipment generally are a result of using poorly maintained equipment or inexperienced and unqualified personnel.

Third, the cylinders of oxygen and acetylene should be chained to the structure or otherwise fastened so that they cannot be accidentally overturned while in use. Always leave the "T" wrench in place on the valve of the acetylene cylinder so that the acetylene can be turned off quickly in case of any emergency.

There are certain precautions to observe in protecting the structure among which the following are important:

Be sure to keep clear space between cylinders and the work. This is important so that cylinders and regulators can always be reached quickly.

Do not relight flames on hot work in a pocket or small confined space. Always relight with a lighter in such instances. Before starting to cut, make certain there is no material nearby or openings leading to material that flame, sparks, hot slag or hot metal might ignite. Particular attention should be paid to areas under the structures to avoid the possibility of sparks or molten metal igniting brush or debris.

A fire extinguisher of a type which contains no water or solution should be made available if possible.

If there is a possibility that a smoldering fire may have been started, keep a man at the scene of the work for at least a half hour after the job is through.

Finally, always wear approved goggles and proper clothing.

Keep oxygen away from oil or grease. Oil or grease in the presence of oxygen under pressure may ignite violently. Be sure there is no oil or grease on gloves or hands.

## Don't Take Chances

By LAMOTTE GROVER

Welding Engineer, Air Reduction Company, Inc., New York

In the performance of oxyacetylene cutting and welding operations, the various precautions for fire prevention, personal safety and protection of property and equipment are for the most part inseparable. Most of these precautions have a common, direct significance in all aspects of safety. Further, even a minor personal injury may incapacitate a workman so that he is less alert, and thus may result in fire or other damage to property and equipment.

For this reason, any safety precautions and rules that are formulated for a particular operation, such as oxyacetylene cutting in the repair of steel bridges, should cover all aspects of safety. A thorough study should be made of various publications on this subject to guard against omission of items that may not seem too obvious but may be important under some circumstances. Specific references to several such publications will be given later as well as a summary of precautions that should be taken.

One of the most important precautions for fire prevention is to keep hot slag, sparks or flames from setting fire to combustible materials. It would seem that the flammable materials most likely to require removal to a safe distance, or protection from fire hazards, around a steel bridge repair job, would be the ties and other timber parts of the track structure, wood

handrails, temporary scaffolding, tool sheds and other housing on or beneath the bridge, particularly any parts that may be oily or greasy; also any drums of oil, gasoline or other flammable liquids or gases. In the case of a crossing over a highway or a navigable stream, protection would have to be provided for traffic beneath. Other possible materials requiring protection are timber pile and trestle bent approaches, timber cribbing, pipelines carrying flammable gases or liquids, weeds and brush.

In addition to the usual safety precautions to be taken when repair work is being done under traffic, it is very important to keep oxygen and acetylene hoses, as well as cylinders and other equipment in the clear of traffic. This has a bearing upon fire protection as well as general safety.

One of the most comprehensive publications of safety rules pertaining to welding and cutting is the American Standard "Safety in Electric and Gas Welding and Cutting Operations," Z49.1, of the American Standards Association. It was prepared under the sponsorship of the American Welding Society.

A publication of the International Acetylene Association, "Safe Practices for Installation and Operation of Oxyacetylene Welding and Cutting Equipment," pertains specifically to oxyacetylene operations. It goes further into the background and reasons for establishing such rules.

Some of the manufacturers of oxyacetylene welding and cutting equipment have published small, pocket-size booklets or handbooks that can be carried conveniently by operators—for example, "Safety Cautions and Rules Governing the Use of Oxyacetylene and Arc Equipment for Welding and Cutting," published by Air Reduction. This booklet is a concise compilation of simply stated rules and "Do's" and "Don'ts," based upon many years of experience. If these comparatively few rules are observed carefully and conscientiously, welding and cutting operations can be carried out safely without hazard to persons or property.

A completely adequate discussion of precautions against fire hazards is impossible. Only some of the aspects can be discussed that seem to be particularly significant in minimizing fire hazards in the repair of steel bridges by welding and oxyacetylene cutting. Safe

practices for the operation of oxy-acetylene cutting equipment may be summarized briefly, as follows:

1. Use suitable, reliable equipment and accessories. Keep them clean and in good condition and repair, and operate them strictly in accordance with instructions. Do not use oil or grease on apparatus, equipment or cylinders, nor operate or store them where oil, grease or other readily oxidizable substances are near. Do not use oily or greasy gloves. Oil or grease in the presence of oxygen may ignite with explosive violence.

2. Insist that operators wear and use proper protective clothing and accessories, such as gloves, aprons, shoes and goggles.

3. Use the oxygen and acetylene gases and apparatus only for the intended purposes, and not for dusting off clothing, cleaning work pieces, or other unintended or abusive uses.

4. While welding or cutting, clear flammable material from the working area and below it (30-ft. radius) if at all possible.

5. When lighting or handling the torch, keep flame pointed away from personnel, flammables and equipment. Keep the flame and sparks away from cylinders or hose.

6. Keep storage of all cylinders, empty or full, away from sources of heat and contact with electrical circuits, and at a suitable distance from working areas. Never strike an arc or tap an electrode against any cylinder. Always keep acetylene cylinders upright. In transporting cylinders by crane, use cradles, platforms or other suitable supports. Do not use electric magnets or slings or hooks through the caps. Use approved pressure regulators. Close all cylinder valves when not in use. Leave valve wrench in position whenever acetylene cylinder valves are open, to facilitate quick closing in an emergency.

7. Be sure all connections are tight. Never try to locate a leak with a flame—use soapy water.

8. Do not crimp hose to stop flow of gases. Do not let hoses lie where they will be run over or be otherwise injured, or be tripped over. Do not repair hoses

with tape. Escaping acetylene may start a serious fire.

9. In the event of a flashback, or a backfire of more than momentary duration, close the torch valves immediately (oxygen cutting valve first, followed by oxygen preheat and then acetylene). Before relighting torch, inspect carefully for damage, including interior damage to hose. Discard or replace damaged parts. Ascertain causes of flashbacks (lack of purging, improper pressures, kinked hose, improper condition of apparatus, etc.). Then correct the faulty conditions before relighting the torch.

10. Have suitable equipment available to put out a fire if one should start. If there is flammable material near the area of operations, keep a watchman on duty for at least an hour after operations have been shut down.

More accidents are caused by people doing things they know are hazardous than by ignorance. Don't take unnecessary chances. It is better to profit from experience of others than to learn the hard way.

## Where and How Many Rail Anchors?

To what extent, under particular conditions, have the number and positioning of rail anchors been changed in recent years to provide better anchorage? What have been the results? Explain.

### No Definite Answer

By CHIEF ENGINEER

In an effort to develop an answer to this question I have, during the past month, looked over a number of locations where we have applied anchors in various patterns in an effort to ascertain, if we can, the best patterns for general use and also patterns to meet specific conditions. Some of these installations have been in service four to five years and others a comparatively short time. For example, in constructing the new track on a change-of-line project completed a few years ago, we installed various patterns of rail-anchor applications on adjacent stretches of track in an effort to determine, if possible, the best method for anchoring under normal conditions. A recent inspection of these applications indicates to date there have been no developments from which any conclusions can be drawn.

Similar conditions obtain on applications to meet special conditions. An inspection at one location sometimes indicates the possibility

for conclusions and then you find conditions at another location which knock the idea you get into a cocked hat.

For these reasons I do not feel qualified at the present time to provide a definite answer to the question. In fact, the more we work with this problem the more it appears to me that the best solution at any location is to anchor according to best judgment based on past experience and then watch developments and revise the anchor pattern as may be required to meet them.

### Use Adequate Anchorage

By LEE SPENCER

Track Supervisor (Retired), Long Island, Phoenix, Ariz.

Rail anchorage and the results to be derived from using any certain number of anchors, and/or any certain method of distributing them along the rail base, is a most complex problem. One would almost have to have exact knowledge of the particular condition in mind before arriving at a complete

answer. Many factors affect the final results, such as nature of traffic, operating speeds, weight of rail, number of tracks, gradients, curves, types of tie plates and rail fastenings used, subgrade conditions, and type and character of ballast used. Consideration must also be given to include continuous welded rail as well as conventional jointed track.

In my recent years of observing track on various railroads, the greatest single change I have noted has been the increased recognition by M/W engineers of the importance of rail anchorage. This increase in recognition is reflected by the drastic increase in the numerical number of anchor units used per rail length today as compared to past practices and standards. At the same time I find just about as many different methods of distributing this increased number of anchors along the rail length as there are railroads I travel over or M/W engineers I talk to. Inquiry as to the exact reasons for any particular grouping I observe always elicits the same reply: "This distribution seems best suited to the very peculiar conditions we have on our railroad." With the single exception of continuous welded rail locations and a general following of the AREA recommendations of "box" or "two-way" anchorage on alternate ties, no one single system of either the number used or any certain system of their distribution

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seems to predominate or be universally accepted by all.

My observations of various test tracks result in the firm conviction that we necessarily must have two basic and fundamental objectives when we render judgment on anchorage results. The first and primary objective is sufficient and adequate anchorage to insure against the hazards of buckled track. In my judgment the number of anchor units used per rail length today is sufficient and adequate to attain this one objective. A check of ICC train-accident statistics from this cause these last few years substantiates this fact.

Nevertheless, in my judgment, with the single exception of those locations laid with continuous-

welded rail and either "box" or "two-way" anchored as I previously mentioned, these same observations on these same tracks reveal a woeful lack of adequate anchorage to attain the second objective—true economy. The general instructions issued in most roads' M/W manuals have so much anchorage latitude on conventional jointed track as to result in a giant and expensive guessing contest as to what amount and in what direction the rail will move. Most anchorage instructions state—if the rail moves, more anchors are to be applied. My experience always proved, however, that once the rail moves, the damage is done. Batter and rail-end wear once started never stop until costly repairs are

made or such rail is replaced.

But "box" or "two-way" holding power on a sufficient and adequate number of ties holds the solution to an entirely new concept on track service life and track expenditures as we know them today. By sufficient and adequate anchorage we can now create an "engineered" track structure of any strength we desire, incorporating any or all the good points we have found desirable in our present conventional jointed track, and with these same time-tested materials eliminate the faults we have found.

If the same amount of anchorage were applied to conventional-jointed track as to continuous-welded rail, such track could be laid tight and kept that way.

## Damming Effect of Dirty Ballast

What methods can be used to break up the damming effect of dirty shoulder ballast in stone and gravel ballasted track, where cleaning and disposing of the fouled ballast may not be desirable or feasible? How effective are these methods and how often should they be used? Explain.

### Scarify and Disc

By R. H. EGBERT

Engineer, Maintenance, Toledo, Peoria  
80 Western, Peoria, Ill.

Dirty Shoulder ballast is a problem which confronts all railroads and is a condition that is responsible for poor drainage of the ballast section, pumping of track

and rough track. This condition can be corrected by several methods.

(1) Scarify—this should be done at least twice a year preferably in spring and fall. This can be done with several machines now on the market such as the Kershaw Ballast Regulator, Fairmont, or such device.

(2) Discing—this should be done at least twice a year and should follow immediately behind the scarifier. The discs should be first set to turn the ballast away from the ties and then discs reset to pull the ballast back to normal. The discer should not be operated in excess of 10 mph.

After ballast has been worked with scarifier and discer it is recommended that the ballast section be redressed to a uniform section.

We have found that this method works satisfactorily in most cases except that when the ballast is badly cemented or in yard areas. If this condition exists a reballasting program is recommended.

## Preventing "Cold-Weather" Roof Leaks

What causes cold-weather roof leaks? In what types of roofs do they occur? How can they be prevented? Explain.

### Maintain Oil Content

By A. L. BECKER

Engineer of Structures, Missouri Pacific,  
St. Louis, Mo.

Through the years it has been a generally accepted practice to make a thick application of asphalt to the finish or wearing surface of a built-up roof. Here is where we believe a great deal of the trouble lies due to the tendency of the hot sun to evaporate the oils from asphalt, causing it to become hard and brittle. Then, when the asphalt becomes exposed to the cold, it contracts and starts to crack, this

condition being greatly aggravated during the winter months. The asphalt and the felt beneath are bonded so tightly that when the asphalt starts to contract, the fibers in the felt are torn and broken, and holes start to develop. This procedure follows through the various plies, and eventually will cause the roof to leak.

From the above conclusions we have adopted the practice of finishing our roofs with a roof coating containing an abundance of oil, followed with periodical applications to keep the felts pliable. We are convinced that the use of this method of treating our roofs has

extended their service greatly.

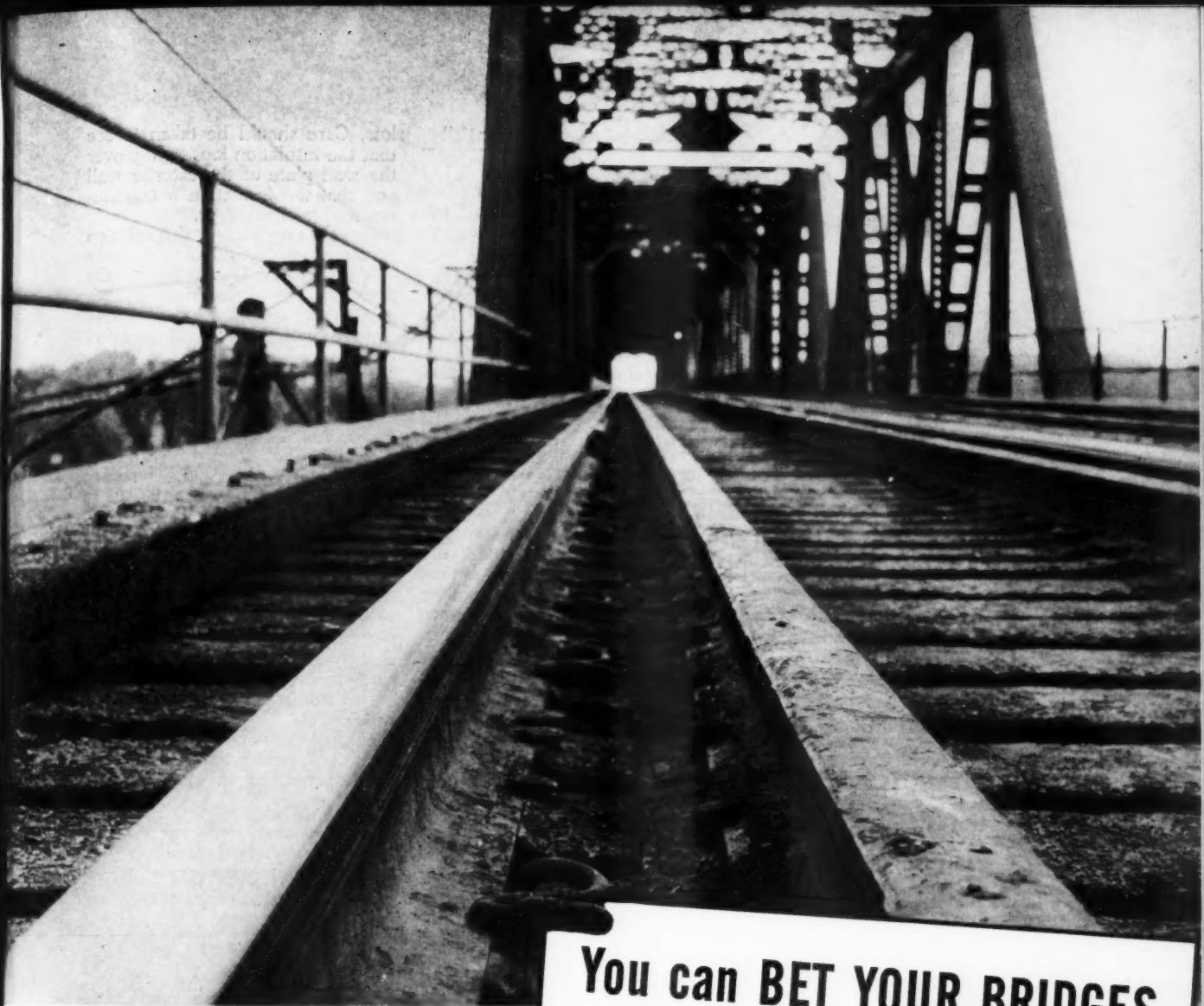
We are also completely in agreement that most of the winter "leaks" are not truly leaks at all, at least as far as the roof is concerned. The common cause for wet or damp spots during the winter time comes from the condensation of vapor formed by the warm air striking the cold, uninsulated, surface of a roof deck and changing to water.

### Insulate and Ventilate

By ENGINEER OF BUILDINGS

The combination of heavy snows and below-average temperatures can often bring about so-called "cold weather roof leaks" if the proper precautions are not taken.

(Continued on page 876)



MACBETH SPIKE ANCHORS at work for one of America's leading railroads on an important dense traffic bridge (above).



MACBETHS are easily driven into ties—AND THEY WON'T WORK LOOSE!

## You can BET YOUR BRIDGES on this rail creepage control

The *Macbeth Spike Anchor* combines more advantages than any other device for controlling rail creepage on bridges and approaches.

- ✓ One piece construction
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### What's the Answer? (Cont'd)

Such conditions often produce "ice dams" on the eaves of buildings which can cause severe damage to exterior siding and paint and interior wall finish. Such ice dams are initially caused by water from melting snow on the upper portions of the roof running down into the eave overhang or gutter and freezing. The underlying cause of this action is that heat escaping from the building causes the initial melting and, since the eave and gutter are constantly exposed to the outdoor temperature, freezing occurs when the water reaches them.

The mere formation of ice dams does not, in itself, cause damage to the building. The damage arises where a progressive build-up of ice has extended a foot or so above the eave. Under such conditions the heat escaping from the building causes the underside of the ice sheet to melt. When this melting action occurs, the water produced is prevented from escaping to the gutters by the frozen dam of ice on the eave projection below it. Nor will it refreeze as long as heat is still rising from the building. This water, along with additional water from the continually melting snow on the roof above, is then forced to flow back under the shingles and down through the roof sheathing to the ceiling, wall, or roof overhang below. Such water often works in behind the fascia board behind the gutters, and across the soffit board of closed cornices. The water may then leak out at the junction of the soffit board and frieze member and run down the face of the wall, or it may work its way in back of the siding and wall sheathing. In the more extreme cases such water will drip down on ceilings near their juncture with the wall.

Such conditions will arise wherever excessive heat is lost from a building under the circumstances mentioned above. Especially vulnerable are buildings with valleys and dormers which allow a greater concentration of water in one region. Buildings with poorly insulated ceilings are vulnerable as are those in which there is not adequate ventilation of the unheated space directly beneath the roof.

Since the cause of ice dam formation is the melting of snow by heat escaping from the building, adequate insulation carefully placed on the ceiling below the roof is needed to minimize the heat

loss. Care should be taken to see that the insulation laps tightly over the wall plate of the exterior wall and that the insulation is continuous and without gaps.

Perfect application of insulation is not always possible to achieve due to the inability to inspect the area adjacent to the eaves. This is particularly true in the case of low-pitched roofs because of cramped headroom.

To make sure that excessive heat does not build up, adequate ventilation should be provided at the eaves. Authorities generally agree that the most effective ventilation of an attic cavity is achieved by ventilation openings placed both at the eaves and as high as practicable in the gable ends. If there are no gable ends, the upper vents should be well up toward, or at, the ridge. In this manner, with the vents at different elevations, a natural movement of air is produced in the same manner as is the draft in a chimney.

For maximum effectiveness, approximately 2 sq. ft. of vent area should be provided for each 300 sq. ft. of ceiling area. This vent area should be divided equally,

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half at the eaves and half as near the ridge as possible.

Adequate flashing of valleys,

dormers and eave fascias will also aid in preventing such leaks and, when employed in conjunction

with good insulation and adequate ventilation, will prevent future leaks and resulting damage.

## Leakage in Wood Water Tanks

When a wood water tank starts to leak badly around the chime, how can effective repairs best be made? Explain.

### Investigate Thoroughly

By GEORGE CLARK  
Engineer of Water Service, Canadian  
National, Winnipeg, Man.

By the time leakage around the chime takes place the structure is getting pretty old or is suffering from faulty maintenance. A thorough examination of the physical condition of the staves, bottom planking and supports should be made to make sure that any work contemplated would be worthwhile.

Assuming that the material is in good condition and that adjustment of the tension in the hoops is adequate to give the best fit possible, any further leakage can be stopped by application of a suitable non-hardening sealing compound at the junction of the tank bottom and the staves inside the tank. If there is also damage to the bottom planking this will have to be sealed off separately.

Actually the chime itself does not leak water as its function is purely mechanical in providing a means of applying a wedging action to hold the upper portion of the stave hard against the bottom planking of the tub. Should the chime break off or rot to the point where it loses its mechanical strength to maintain a tight joint, the stave may move upward enough to permit leakage, hence the suggestion that a sealing compound be used at the junction of staves and tank bottom on the inside of the tub. Warping of the bottom planking may be the prime cause of a broken chime and leakage may occur, not because the stave moved upward, but because the bottom plank warped downward.

If leakage occurs around the chime in a new tub it is possible that too many staves were used in its construction and some allowance must be made for swelling of the staves after water is placed in the tub. If no allowance for this is made, the actual diameter of the

tub will increase and not fit the bottom planking properly and it may always leak unless a suitable sealing compound is used.

Like most problems there must first be a thorough investigation as to the cause of the apparent fault before the best repair method can be devised and applied.

### Use Sand and Cement

By C. C. GREEN  
Master Carpenter, Baltimore & Ohio,  
Wheeling, W. Va.

Effective and lasting repairs can be made to water tanks that have developed leaks around the chime by first stirring the collection of residue that gathers in the bottom of the tank with a pole or piece of pipe long enough to be worked from the tie beams. After a thorough stirring, by using a 3-in. or 4-in. conductor pipe of sufficient length to reach the bottom of the tank, a dry mixture of fine sand and Portland cement can be poured directly to each location as required to completely stop the leaks.

In cleaning wood water tanks care should be used to allow a small portion of the residue around the chime to remain in the tank, thus precluding the reopening of old leaks repaired as mentioned above.

### Line With Tar

By GEORGE S. CRITES  
Division Engineer (Retired)  
Baltimore & Ohio, Baltimore, Md.

Most often when wood water tanks leak badly around the chime, the bottom of the staves and the rim of the floor are too soft to allow for lasting results to be obtained either by hoop tightening or by calking.

Some quite rotten cold-water tanks have been held in unleaking service for many years by running a thin 3-in. strip of wood edgewise

entirely around the inside of the tank and securely fastened to the floor at about four inches from the inside of the staves and then running the space between the wood strip and the staves full of hot tar road-topping mix.

The surface of the wood that is to be tarred should be reasonably dry before the tar preparation is poured and when the wood tank is for containing hot water or liquids, the tar preparation should be of a consistency which will not run freely at the highest temperature it will be subjected to.

### Two Methods

By GUY E. MARTIN  
Superintendent of Water Service,  
Illinois Central, Chicago

Leaks that develop around the chime of a wood water tank are due to the splitting off of a portion of the lower section of the staves or to the deterioration of the bottom boards and staves at the point of contact.

Leakage in this section of a tank usually is slight to begin with, but is sufficient to keep the lower end of the staves wet, which results in damage due to freezing thus causing an increase in leakage. When such leakage is sufficient to keep the ends of the staves wet most of the time, the deterioration is rather rapid leaving a poor contact surface between staves and bottom boards.

When leakage occurs at the chime, a close examination of the condition of the timber on the inside and outside of the tank should be made to determine the degree of deterioration of the timber at the point of leakage. If the timber is sound, fine rotten cinders, mixed with clay or cement introduced into the tank near the point of leakage, through a 2-in. or 3-in. pipe from top of tank, will be drawn into the area of the leak and will reduce and sometimes stop the leak immediately. This method may be desirable for temporary repairs when the timber is rotted, until a more substantial method may be used. A good grade of clay alone, applied 6 in. to 8 in. deep in the area of leakage has also proved effective in the stoppage of leaks. The tank must be filled



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### What's the Answer? (Cont'd)

slowly to minimize erosion of the clay.

When the timber is deteriorated at point of contact, it is necessary to re-establish a good contact between the bottom and staves with sound timber before effective or lasting repairs may be expected. The inside surface of a stave that has been covered with water at all times is usually sound. A subfloor, about 18 in. from staves, may be installed in areas of leakage to secure the sound timber needed to contact the stave. The use of 3-in. by 12-in. well-seasoned and dry untreated timber securely fastened to the old floor and tightly fitted to the surface of the stave is recommended. Any cracks or joints left where leakage might occur should be caulked with oakum before the tank is refilled. If, after the tank has been in service for two weeks, there is evidence of any leakage, it should be treated as recommended above for sound timber.

### Use Dirt and Cinders

By L. A. SHAEFER

Water Service Foreman, Missouri Pacific,  
Osawatomie, Kan.

The original construction of the round wood water tank is most important to the life of the tank and the years of service it will give and, if it is properly assembled and particular care is given to see that the floor boards are straight and edges are true and that the chime fits perfectly, it will give good service. If the edge of the floor board is too thick and the staves are forced on, the staves sometimes split off below the floor edge and cause leakage.

Unless the leak is stopped within a short time decay starts and a bad spot is formed in a new tank. The staves should close snug when the hoops are pulled up so that there are cracks between the staves. Above the floor the bands can pull the staves tight, but at the floor the right amount of stave must be in the tank to make a perfect fit at the chime.

A leaky spot in any wood tank, unless stopped, will soon cause decay and get worse. The decay starts from the outside of the tank where the air comes in contact with the water and wood and gradually eats its way to the inside of the tank.

Depending on the type of wood the tank is made of and where a leak occurs, the rotted wood will often sluff away leaving a hole, while at other times the wood becomes spongy allowing the water to seep through.

On any railroad where steam locomotives are used it is very necessary that water tanks be kept in service continually in order not to disrupt train service. Therefore, when a leak shows up in a water tank every effort should be made to stop the leak as soon as possible without taking the tank out of service. I believe that every suggestion that anybody ever made about stopping leaks has been tried one time or another on wood water tanks.

It is wise to make frequent inspections of old tanks that have wide bands since such bands will rust on the side next to the wood and still look good on the outside. Unless close inspection is made, such bands might break before any weakness is noticed. Inspection also should be made inside the frost box where the pipes run through the floor of the tank, since vibration from trains or heavy freezes and thaws sometimes loosens the packing or caulking around the pipes at the floor, resulting in leakage.

When some of the older tanks were erected, floor flanges and stuffing boxes were not used and the hole for the pipe to go through the floor was sawed on a bevel or tapered and caulked with hemp. The most successful way I have found to hold the caulking around such pipes, is to caulk and leave the hemp about 1½ in. below the top of the floor and run full of lead and caulk. If for any reason a leak ever shows from vibration or other causes the tank can be drained and the leak recaulked in a few minutes. The tank can then be placed back in service in a very short time.

Climatic conditions have a lot to do with leakage in old tanks. After a cold winter, old tanks can be expected to leak more or less from thermal expansion and hot, dry summers are very hard on that side of a wood tank where the sun's rays beat down 12 and 16 hr. a day, especially when the water in the tank is low. The staves dry out fast under such conditions and the tank will leak.

Old water tanks have been kept in service a good many years by stopping leaks as soon as possible after they show up and not letting a small leak become larger—thus holding the maintenance cost to a

minimum. Concrete floors have been run in wood tanks but not with much success as far as stopping small leaks is concerned. When concrete sets it has a tendency to shrink. Also, the concrete keeps the water away from the wood, causing the wood itself to dry out and shrink.

Asphalt, clay, dirt, cement, and ashes or cinders have all been tried for stopping leaks and a mixture of fine cinders and dirt has given the best results in stopping leaks in the tank floors and chimneys.

Leave the water in the tank and get the mixed cinders and dirt to the spot by dropping the material through a hole in the roof directly over the leak or feed it through a pipe to the leak. Stir the cinders and dirt around with a long pole and the water pressure will pull the cinders and dirt into the hole and seal the leak.

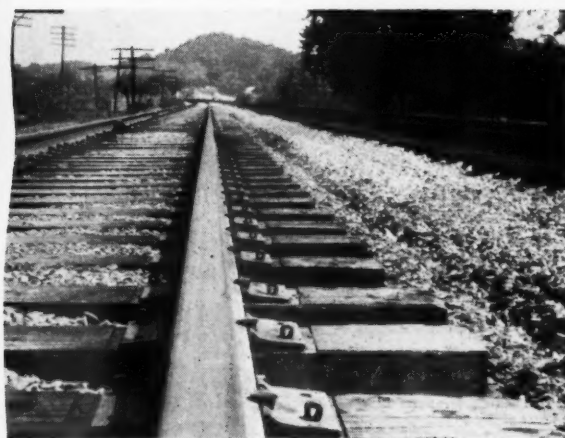
Dirt by itself will seal small leaks but, if they are too large, the dirt alone will wash through. Fine cinders, however, will hang in the

(Continued on next page)



Actual size

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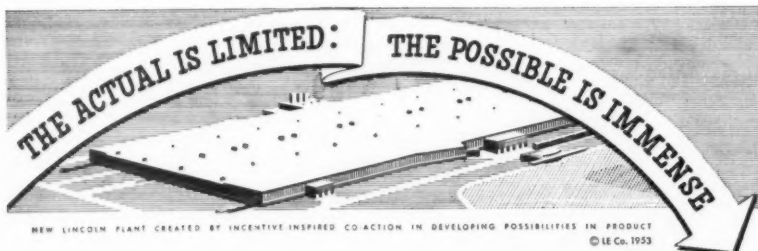
## What's the Answer? (Cont'd)

hole and block it allowing the dirt to seal the leak. Leaks stopped in this manner have held several years before a hard freeze and thaw started some to leaking again. By again stirring the same cinders and dirt that were previously put in the tank, such leaks can often be stopped a second time.

Leaky staves are sometimes a problem when they are dried out and the hoops cannot be tight-

ened. In order to hold the water in such a tank until it is filled and the staves soaked up, a sack or two of beans put in the tank has sometimes been used to good advantage since it floats. The water will carry the beans to the cracks to plug them and stop the leakage.

These are most of the methods I have used and found successful in 35 years of servicing wooden water tanks, but I will say this, in order to keep a wood tank in good shape, keep it full of water—always.



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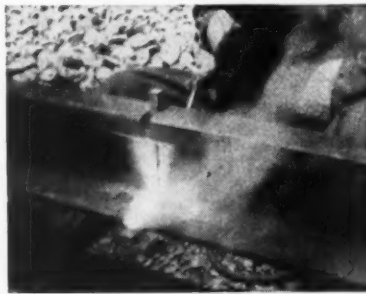
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## THE MONTH'S NEWS Railway Personnel

### General

**W. Jerome Strout**, chief engineer and mechanical superintendent of the Bangor & Aroostook, has been appointed general manager—operations with headquarters, as before, at Bangor, Me., to succeed **J. C. Gardiner, Jr.**, vice-president and general manager, who has resigned.

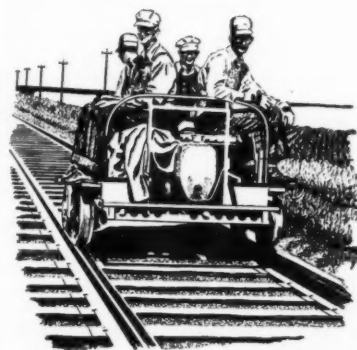
**J. W. Hale**, assistant to the general manager of the Atlantic Coast Line and an engineer through training and experience, has been appointed engineer assistant to the general manager with headquarters, as before, at Wilmington, N. C.

Effective August 1, the jurisdiction of the division engineer of the Sioux City and Northern Iowa districts of the Chicago & North Western, with headquarters at Sioux City, Iowa, was extended to include the Sioux City Bridge Company, that portion of the Western division west of Sioux City, and the entire Sioux City Terminal. That portion of the Western division east of Sioux City remains under the jurisdiction of the division engineer at St. Paul, Minn.

**S. J. Hale**, superintendent of the Radford division of the Norfolk and Western and an engineer through training and experience, has been appointed to the newly created position of assistant manager of roadway maintenance with headquarters, as before, at Roanoke, Va.

Mr. Hale joined the N & W in December, 1906 as an axeman in the engineering department and subsequently served as chairman, rodman, transitman, and resident engineer until January, 1936 when he was appointed roadmaster on the Radford division. He was named assistant superintendent of the Shenandoah division in March 1938 and, after serving in the same capacity on the Pocahontas and Radford divisions, was named superintendent of the Radford division in January, 1944—the position he held at the time of his recent promotion.

**E. M. Jelly**, division engineer on the Canadian Pacific at Brownsville Junction, Me., has retired after more than 15 years of service.



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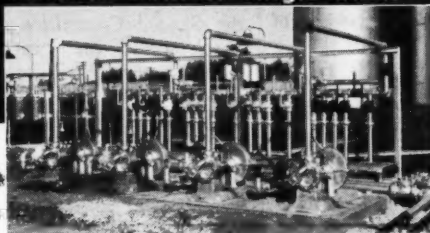
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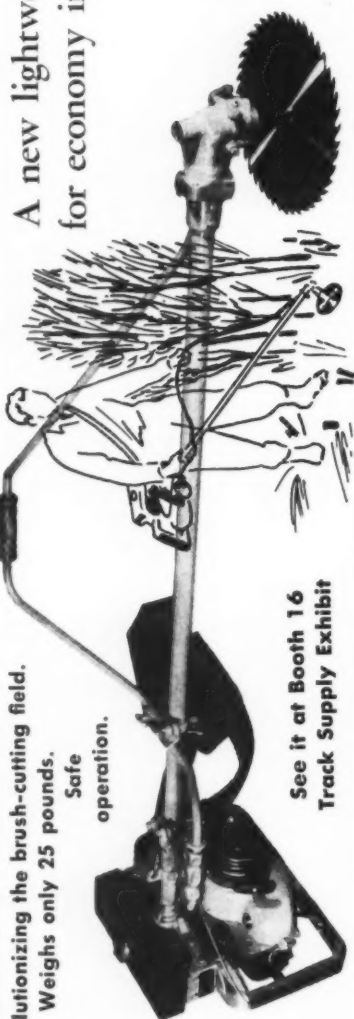
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## Railway Personnel (Cont'd)

David Wetterau, assistant trainmaster on the Southern and an engineer through training and experience, has been appointed to the newly created position of trainmaster at Mobile, Ala.

John Edwards, Jr., general manager of the Central Region of the Baltimore & Ohio at Pittsburgh, Pa., has been transferred to Baltimore, Md., to succeed F. G. Hoskins, who has retired after 46 years of service. Both these men are engineers through training and experience.

## Engineering

Arthur E. Willihan, assistant engineer on the Kansas Southern at Kansas City, Mo., has retired after 33 years of service. Herman F. Quinn, Donald Goodwill and Patrick J. McCarthy, assistant engineers at Shreveport, La., have also retired.

H. W. Kellogg, division engineer of the Grand Rapids division of the Chesapeake & Ohio at Grand Rapids, Mich., has been appointed engineer of track of the Pere Marquette district with headquarters at Detroit, Mich. J. L. Alvord has been appointed division engineer at Grand Rapids succeeding Mr. Kellogg.

Robert K. Seals, supervisor of track on the Southern at Salisbury, N. C., has been promoted to assistant division engineer at Knoxville, Tenn.

Mr. Seals was born at Morgantown, N. C., on January 24, 1922. He began service with the Southern as a rodman in April 1946 and became a student apprentice at Seneca, S. C., the following August. Advancing to assistant supervisor of track at Greenville, S. C., in December 1946, he was appointed supervisor of track at Orangeburg, S. C., in February 1948; at Charleston, S. C., in January 1950; and at Salisbury in February 1951.

James K. Weikal, supervisor of track on the Erie at Greenville, Pa., has been promoted to assistant division engineer at Huntington, Ind., to succeed Oliver N. Lackey, who has retired after 42 years of service.

R. H. Morrison, assistant chief engineer of the Bangor & Aroostook, has been promoted to chief engineer with headquarters, as before, at Houlton, Me., to succeed W. Jerome Strout, who has been appointed general manager—operations.

R. A. Pasternak, instrumentman on the Iowa division of the Illinois Central at Waterloo, Iowa, has been promoted to assistant to the division engineer of the Chicago Terminal division at Chicago, succeeding J. H. McGee who has been transferred to the Memphis Terminal division at Memphis, Tenn., succeeding E. H. Lewis, deceased.

Gordon K. Fraser, district engineer of the Southern Ontario district of the Canadian National, has been promoted to assistant engineer maintenance of way of the Central region, with headquarters, as before, at Toronto, Ont. Mr. Fraser is

(Continued on page 884)

A timely, complete treatment  
of railroad location,  
construction and maintenance

# RAILROAD ENGINEERING

Vol. I

By WILLIAM W. HAY, Mgt. E., M.S.  
Associate Professor, Railway Civil Engineering,  
University of Illinois

## Up-to-date

This important new book is right abreast of the latest developments in railroad engineering research. It is written to stay modern. The author includes the basic principles which engineers will always need for guidance in solving current problems and as inspiration for future improvements.

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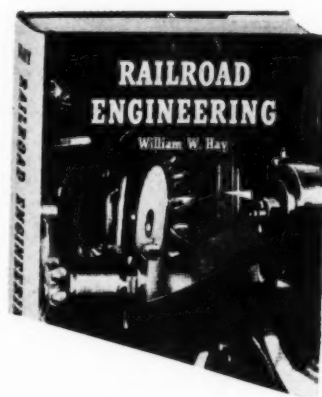
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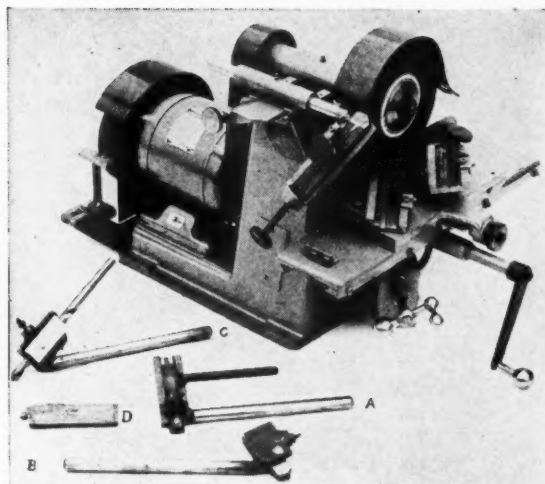


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Here's the dual-purpose unit that revolutionizes railroad yard snow handling! Patented feeder rakes of the Bros Rotary slash and shatter even the hardest packed snow. Twin rotors whip the disintegrated snow back into the melting chamber. From

a myriad of spray outlets, hot water blasts each snow particle . . . fastest melting you've ever seen! Rear section of tank unit collects the water, can take a load of 19,000 gallons before quick dumping. Entire unit mounts on 70-ton flat car.



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width from 9' to 14'. They lift individually to clear platforms, etc. Scarifier cleans down to 3" below rail level. All controls are hydraulic. Write for full information.

*Bros Sno-Meltr dual-purpose units have been proved by use on the Great Northern and the Canadian Pacific railroads.*

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### Railway Personnel (Cont'd)

succeeded by David W. Blair, division engineer at Montreal, Que.

Mr. Fraser, who joined the CNR as a chainman in 1918, served in 1925 as resi-



Gordon K. Fraser

dent engineer for the Rouyn-Taschereau line and prior to his appointment to division engineer at Toronto in 1945 he served as division engineer at Belleville, Ont.



David W. Blair

Prior to his recent promotion, Mr. Blair served as division engineer at St. Jerome, Que. and on the Montreal terminals divisions.

W. H. Goold, assistant division engineer on the New York Central at Erie, Pa., has been promoted to division engineer at Columbus, Ohio, to succeed C. C. Herrick, who has been transferred to Erie to succeed J. L. Cox, who has been appointed assistant engineer maintenance of way, Lines West, at Cleveland, Ohio. W. W. Kerr has been appointed assistant division engineer at Erie to replace Mr. Goold.

J. E. Spangler, assistant division engineer, Electric division, of the New York Central at New York, has been promoted to division engineer of the Mohawk division at Albany, N. Y., succeeding W. J. Kernan, who has been promoted to assistant engineer maintenance of way, (Continued on page 888)



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... where loads are the heaviest ... crews the largest  
... that's where you'll find Fairbanks-Morse Motor  
Cars turning in records of performance, economy  
and safety.

Take the Model 53 for example. The capacity of this  
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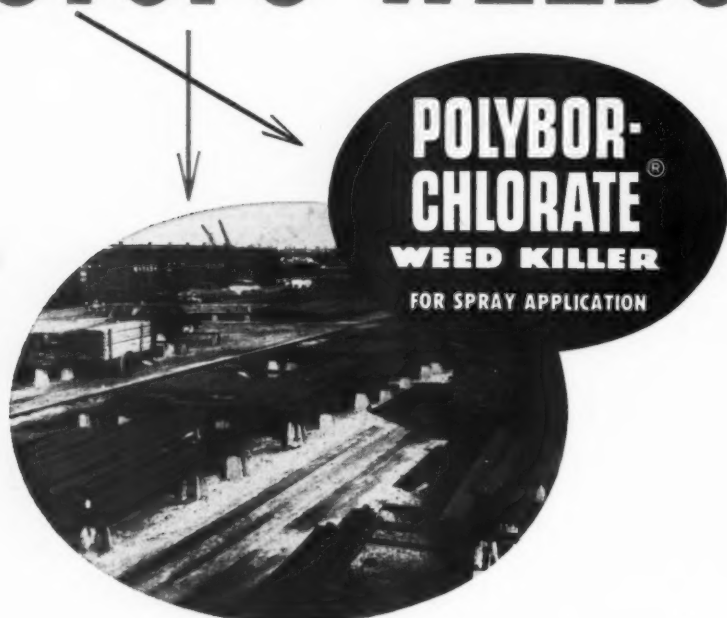
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## Railway Personnel (Cont'd)

Lines East and Boston & Albany, at Syracuse, N. Y.

**N. E. Smith**, division engineer on the Chicago, Milwaukee, St. Paul & Pacific at Minneapolis, Minn., has been transferred to Bensenville, Ill., succeeding **B. J. Worley**, who has been named principal assistant engineer at Chicago. **E. C. Jordan**, assistant division engineer at Minneapolis, has been promoted to division engineer succeeding Mr. Smith.

**J. J. Kasnitz**, chief clerk in the chief engineer's department of the Long Island at Jamaica, N. Y., has been appointed assistant to chief engineer; **J. E. Solarski**, office engineer, has been appointed engineer of construction; and **T. H. Nichols**, engineer accountant, has been appointed office engineer. **George Patton** has retired as assistant engineer.

**Edward H. Cook**, acting engineer in charge at Norris Yard of the Southern at Birmingham, Ala., has been appointed engineer in charge of construction of the new extension to Citico freight yard and connecting tracks at Chattanooga, Tenn.

Mr. Cook was born at Macon, Ga., on August 5, 1907, and was first employed by the Southern as a rodman at that location in March 1926. Leaving the service of the railroad in 1931, he returned in April 1945 as a junior engineer at Charlotte, N. C., and became student apprentice a few months later. He was appointed assistant engineer at Springfield, Va., in December 1945, assistant supervisor of track at Greenville, S. C., in February 1946; and resident engineer, diesel shop, at Chattanooga in March 1947. In February 1950 Mr. Cook was made bridge and building supervisor at Bristol, Va., and in July 1951 he became assistant division engineer at Knoxville, Tenn. He has been acting engineer in charge at Norris Yard since May 1952.

**K. Vavasour**, who was recently promoted to assistant division engineer on the Canadian National at Edmundston, N. B. (RT&S, July, p. 682), was born at Fredericton, N. B., and joined the services of the CNR as a draftsman at Edmundston in 1919. The following year he became a transitman and in 1937 senior instrumentman. In 1942, Mr. Vavasour joined the Canadian army and on being demobilized with the rank of lieutenant, resumed duty as senior instrumentman. In 1952 he was appointed assistant engineer, the position he held at the time of his recent promotion.

**E. J. Huelsman**, supervisor of track on the Cleveland, Cincinnati, Chicago & St. Louis at Bellefontaine, Ohio, has been promoted to assistant division engineer of the Ohio division of the New York Central with headquarters at Springfield, Ohio, succeeding **J. A. Hawley** who has been transferred to the Indiana division at Indianapolis, Ind. Mr. Hawley succeeds **E. M. Roberts** who has been promoted to division engineer of the Indiana division at Indianapolis succeeding **W. B. Hodge** who has retired after 43 years of service. (Continued on page 890)

# When you're "up in the air" about bridge maintenance

Simplify "overhead" maintenance with the Holan heavy-duty hydraulic tower. This new tower is completely automatic with push button controls on the platform, in the cab or in the body interior. Platform can be raised to 30 feet and lowered to approximately 10 feet, 3 inches. On the model illustrated, the platform can be rotated 330 degrees.

This Holan hydraulic tower gives your men a working area approximately 20 feet wide for all heights to about 36 feet. When it is mounted with one of Holan's maintenance bodies, your crew has all necessary equipment and supplies right at hand.

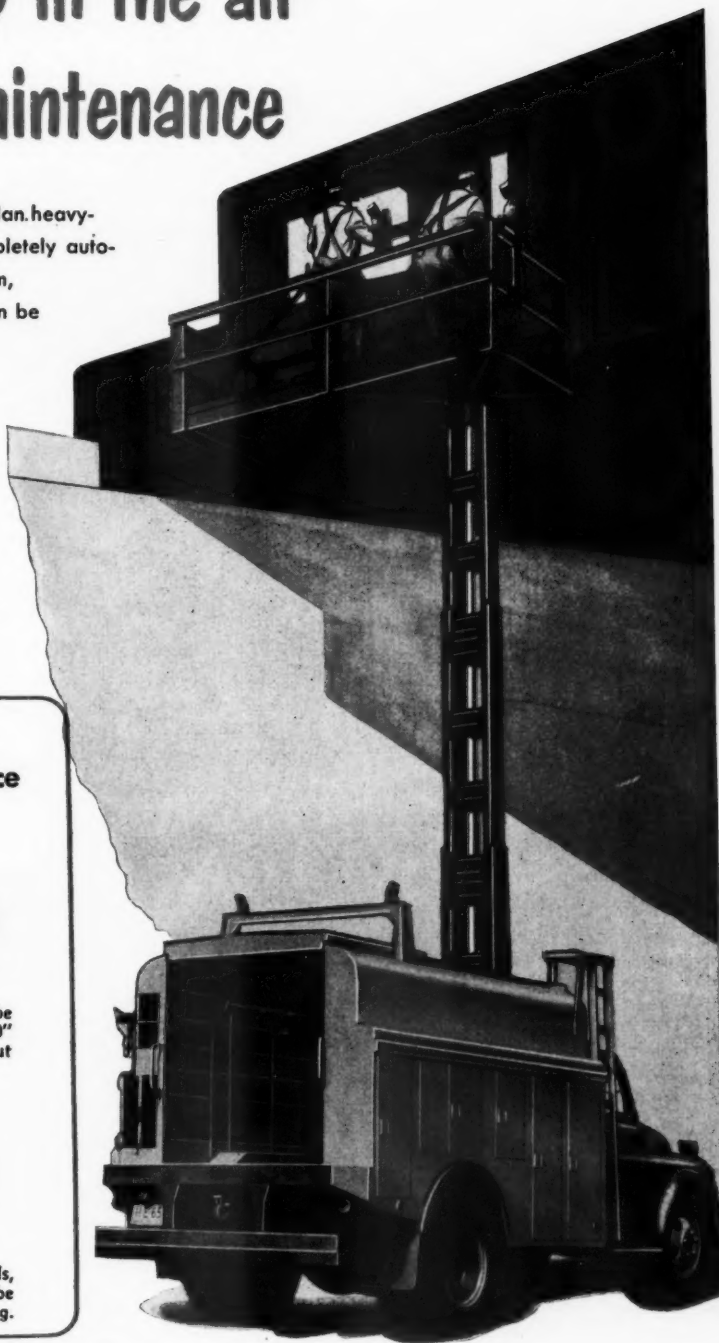
## Complete line of bodies for railroad maintenance and service



Holan construction and maintenance bodies can be mounted on any chassis with CA dimension from 60" to 120". All models can be furnished with or without a built-in crew compartment.



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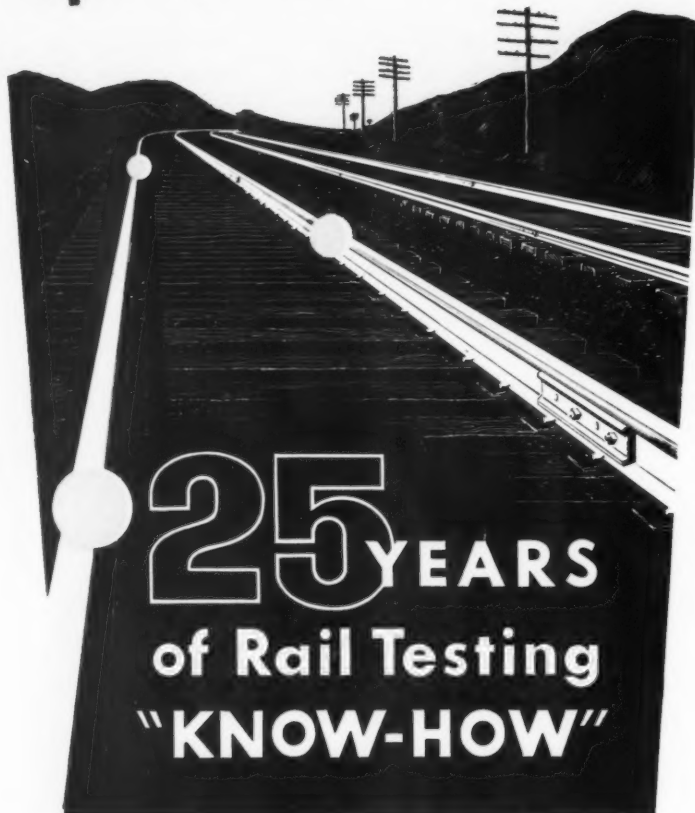
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## Railway Personnel (Cont'd)

**J. A. Barnes**, assistant engineer on the Chicago & North Western at Chicago, has been promoted to division engineer at Huron, S. D.

**Carl H. Johnson**, general inspector on the Illinois Central, has been promoted to assistant engineer in the office of the vice-president and chief engineer with headquarters, as before, at Chicago.

**E. T. Franzen**, assistant engineer in the bridge department of the Great Northern at St. Paul, Minn., has been promoted to assistant bridge engineer succeeding **E. L. Haberle**, who retired July 31 after 40 years of service.

**A. N. Reece**, assistant to the president of the Kansas City Southern and an engineer through training and experience, has retired after 50 years of railroad service.

Mr. Reece entered railroad service in 1903 with the Santa Fe and, from 1905 to 1911 was, successively, transitman, assistant engineer, building inspector, chief clerk and general superintendent transportation for the St. Louis-San Francisco. He joined the KCS in 1911 as assistant engineer and from 1913 to 1942 served as office engineer, division engineer and chief engineer. He was named assistant to the president in 1942.

**Avery C. Low, Jr.**, whose promotion to assistant engineer maintenance of way on the Atlantic Coast Line at Rocky Mount, N. C., was recently announced (RT&S, August, p. 756), was born at Clarkston, Ga., on September 7, 1921, and was graduated in mechanical engineering from Georgia Institute of Technology in 1946. Entering the employ of the Coast Line at Rocky Mount as a junior engineer on June 24, 1947, he subsequently served there, consecutively, as assistant engineer, senior assistant engineer, and acting roadmaster in charge of relaying. On February 15, 1951, Mr. Low was named division engineer at Rocky Mount, and on June 16, 1951, was appointed roadmaster at Wilmington, N. C., in which capacity he served until his recent promotion.

**George H. Echols**, chief engineer maintenance of way and structures on the Southern at Knoxville, Tenn., has been promoted to chief engineer of the system at Washington, D. C., to succeed the late **James B. Akers**. **Robert B. Midkiff**, assistant superintendent at Knoxville, has been promoted to chief engineer maintenance of way and structures to succeed Mr. Echols. **John W. Kidd**, division engineer at Louisville, Ky., as announced elsewhere in these columns, has replaced Mr. Midkiff as assistant superintendent at Knoxville, and **Milton P. Oviatt**, division engineer at Hattiesburg, Miss., has been transferred to Louisville to succeed Mr. Kidd. **Troy A. Barnett**, assistant division engineer at Atlanta, Ga., has been advanced to division engineer at Hattiesburg to replace Mr. Oviatt, and **John T. Hiner**, bridge and building supervisor at Greenville, S. C. has been appointed assistant division engineer at Atlanta to succeed Mr. Barnett.

Mr. Echols was born at Milledgeville, Ga., on June 17, 1901, and was graduated

(Continued on page 894)



# Why Northwestern switched to TIMKEN® bearings for heavy-duty rail grinding wheel

**T**HE accuracy of this 540-A heavy-duty rail grinder hinges on the bearings on the grinding wheel shaft. That's why the Northwestern Motor Company switched to Timken® tapered roller bearings.

Timken bearings must hold the wheel rigid enough to grind all types of rails, frogs, crossovers and switches to exact predetermined limits—regardless of the amount of

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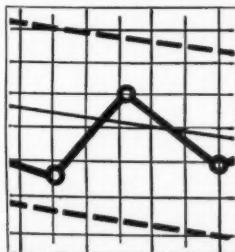
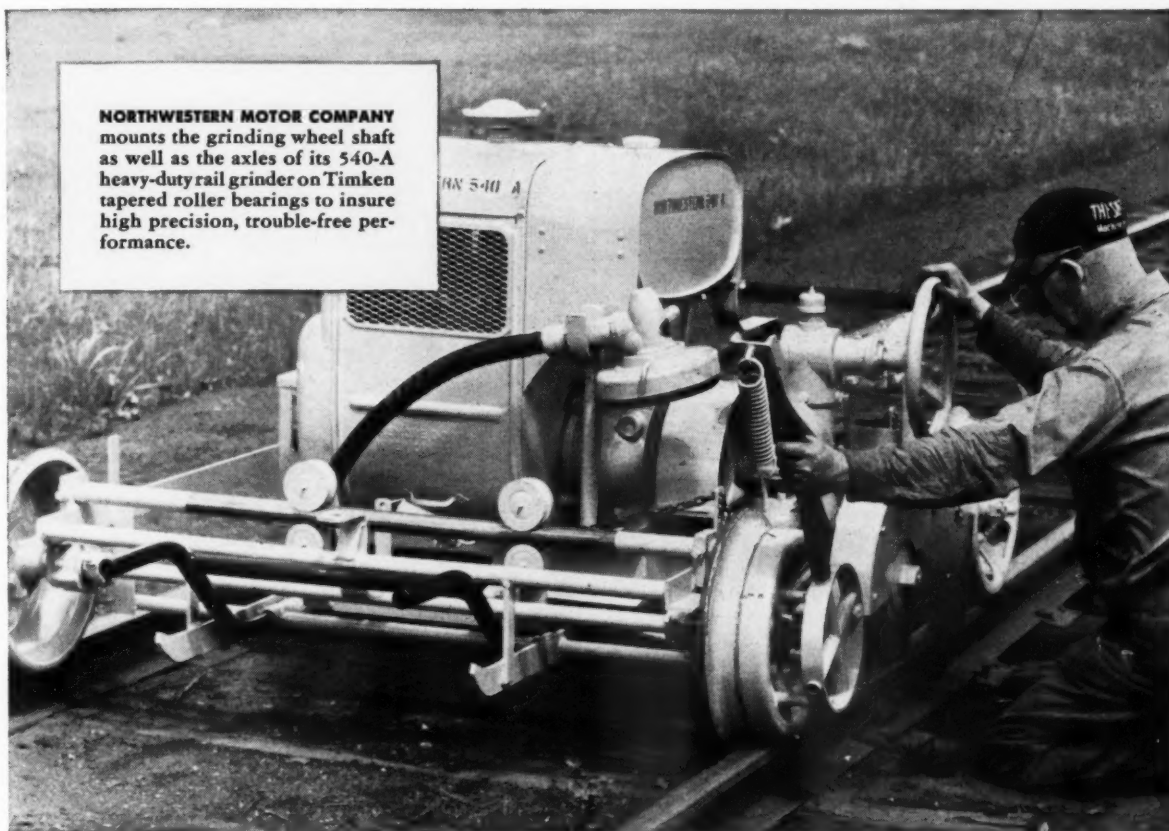
Despite heavy overhung loads, grinding wheel rigidity is assured because Timken bearings' tapered design takes all radial, thrust and combination loads. And line contact between rollers and races gives them extra load-carrying capacity.

Timken bearings' micro-inch surface finish helps cut friction. It's just another reason why you should

specify Timken bearings in the railroad equipment you build or buy. Look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



*This symbol on a product means its bearings are the best.*



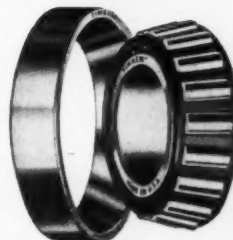
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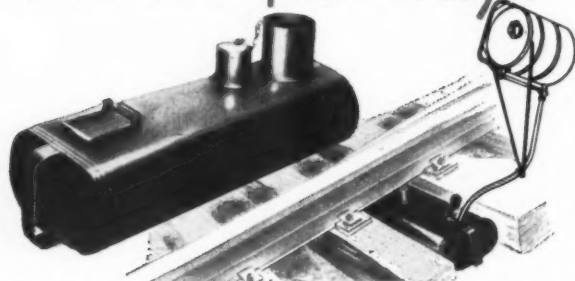
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891

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### The Simple Way!



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Positive, Dependable Flame, Quickly and Easily Installed when and where you want them. 32 hr.-52 hr. Flame Service permits daytime refueling.

Simple to place in the exact position for greatest protection—simple to re-fill and to service... the most economical, satisfactory method of keeping switches in smooth operating condition regardless of weather.

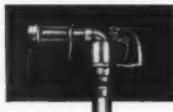
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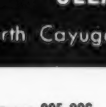
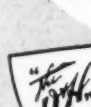
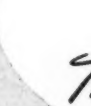
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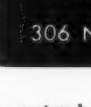
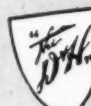
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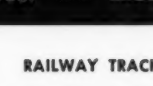
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# HEAVY-DUTY <sup>Air-Cooled</sup> ENGINE POWER

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These machinery builders base their selections of engines on such factors as heavy-duty construction, low-cost operation and maintenance, Air-Cooling that provides trouble-free service in all locations, easy starting, and readily available replacement parts when needed, through a reliable source.

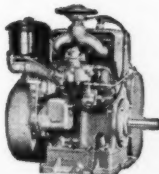
Wisconsin Motor Corporation is the world's largest manufacturer of Heavy-Duty Air-Cooled Engines, from 3 to 36 horsepower, in 4-cycle single cylinder, 2- and 4-cylinder types.

These engines have been used successfully for many years in railroad maintenance-of-way service and for many other types of power applications. Here is dependable power to fit the machine and fit the work for which the machine is designed.

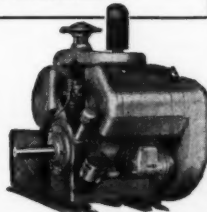
**SPECIAL EQUIPMENT:** Variable speed controls, electric starting, clutch take-off assemblies and reduction assemblies can be furnished on all models. Clutch reduction assemblies available for larger single cylinder and all multi-cylinder models. All models can be furnished with Stellite faced exhaust valves and valve seat inserts and can be equipped to operate on kerosene, butane, fuel oil or natural gas. Write for detailed information.



4-cycle single cylinder  
3 to 9 hp.



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7 to 14½ hp.



V-type 4-cylinder  
15 to 36 hp.



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● The mountain climber's success in scaling a sheer cliff depends to a large extent on his positive grip and rugged durability.

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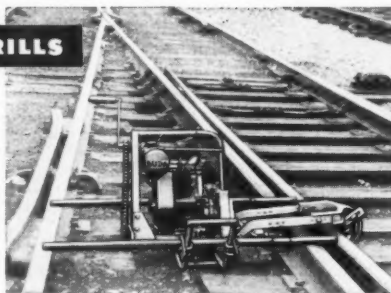


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**Improved design—more holes at lower cost**

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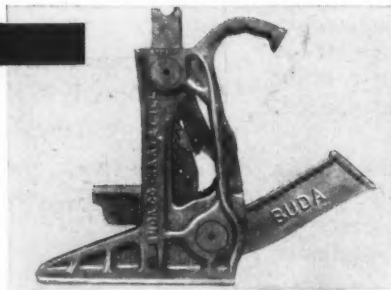


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## TRACK JACKS

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Safe, positive ratchet operation at any angle. Quick-trip feature permits fast load drop when required. Parts interchangeable between models. Light weight, aluminum alloy. Klinch-Klaw Model 225-A pulls bolts, spikes and rods quickly, easily.

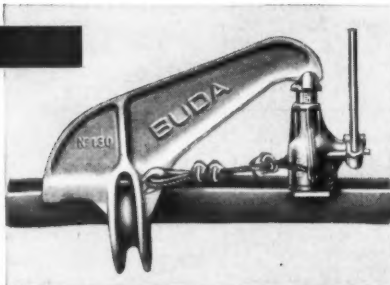


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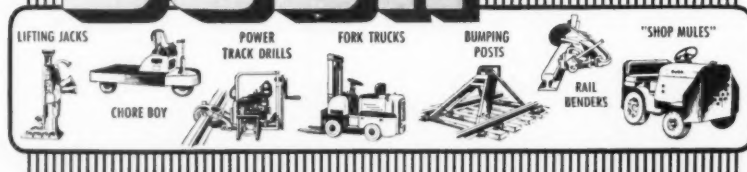


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# BUDA

BR-11



## Railway Personnel (Cont'd)

from Georgia Institute of Technology in 1923. He entered Southern service on May 1, 1924, as junior engineer at Macon, Ga., subsequently serving as assistant engineer there, assistant supervisor of track at Rome, Ga., supervisor of track at Jacksonville, Fla., and assistant division engineer at Atlanta, Mr. Echols was appointed



George H. Echols

division engineer at Atlanta in 1946, and was named chief engineer maintenance of way and structures at Knoxville on January 1, 1950.

Mr. Midkiff was born in Virginia on June 12, 1905, and is a graduate of Clemson College. Entering the employ of the Southern as a rodman at Knoxville in June 1928, he subsequently served, consecutively, as assistant supervisor of track, supervisor of track, and assistant division engineer on the Knoxville division until January 1944, when he was promoted to

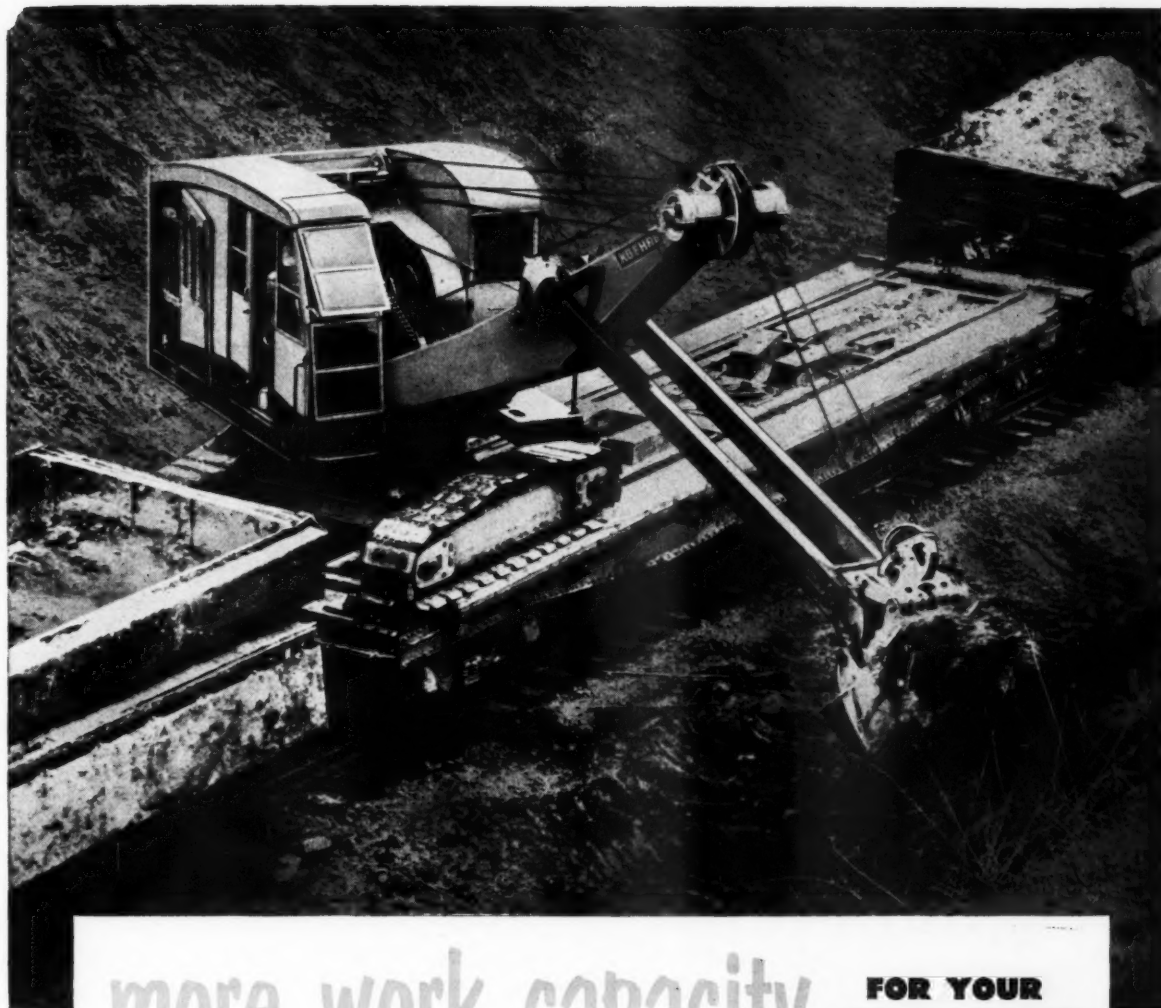


Robert B. Midkiff

division engineer at Sheffield, Ala. In March 1946, Mr. Midkiff was transferred in the latter capacity to Asheville, N. C., where he remained until January 1, 1952, when he was named assistant superintendent at Knoxville.

Ralph R. Smith, who has been appointed assistant chief engineer maintenance of way of the New York Central at New York (RT&S, August, p. 756), was

(Continued on page 896)



## more work capacity **FOR YOUR WORK TRAINS**

On work-train operation, Koehring  $\frac{3}{4}$ -yard 304 has plenty of weight-stability . . . holds solidly to flat car while excavating below grade. Behind its powerful digging crowd and fast swing are many heavy-duty features that help you get more work done. For instance . . .

There's the Koehring 304 booster clutch that requires only  $\frac{1}{3}$  to  $\frac{1}{2}$  the lever pull of a straight manual clutch . . . yet, retains accurate "feel" of load. Clutch has a heat-compensator spring that makes all tension changes automatically. On the single, continuous chain crowd, there's automatic take-up and release of chain tension that gives you maximum dig-in power at every

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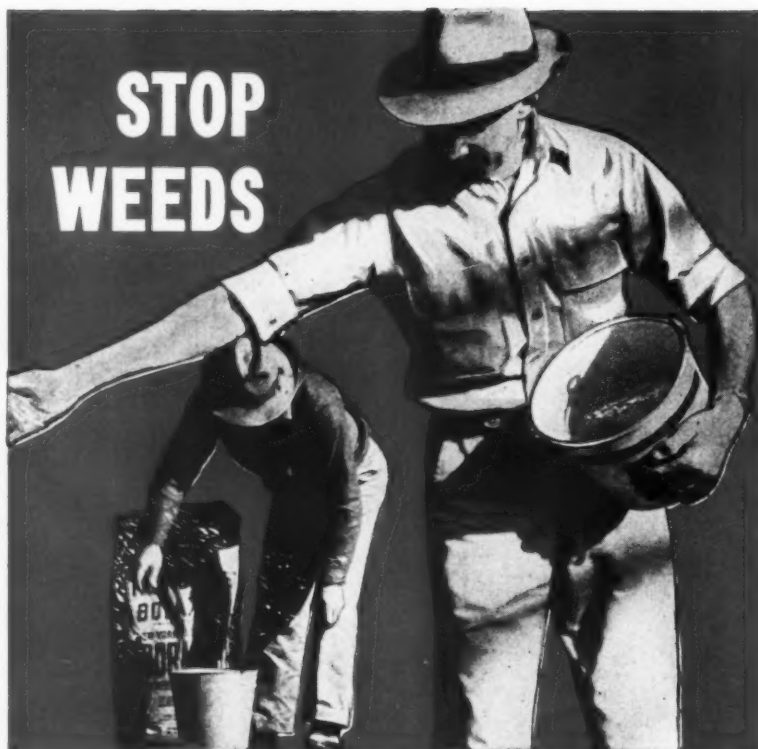
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When **BORASCU**<sup>®</sup> *Is Put To Work!*  
**WEED KILLER**

Roads using BORASCU to destroy weeds and grasses get a bonus in valuable man-hours! Their extra gangs now do track work instead of "grassing" all summer long. BORASCU Weed Killer effectively destroys vegetation for long periods when properly applied; it is especially useful about trestles, tie-piles, signal blocks, small switch yards and other places where spraying with large train equipment is not feasible. Users prove BORASCU is nonpoisonous, nonflammable and noncorrosive to ferroalloys. Applying BORASCU is simple and economical.



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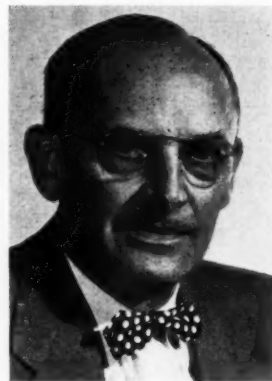
## PACIFIC COAST BORAX CO.

DIVISION OF BORAX CONSOLIDATED, LIMITED

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### Railway Personnel (Cont'd)

born at Buffalo, N. Y., and joined the Central there in 1920 as a chainman. Following promotions to assistant supervisor of track and supervisor of track, he was named division engineer at Jersey Shore, Pa., in 1940. He was appointed assistant district engineer at Cleveland in 1944,



Ralph R. Smith

and earlier this year became assistant engineer maintenance of way there, which position he held at the time of his recent promotion.

Frank N. Barker, chief highway engineer for the State of Illinois, has been appointed assistant chief engineer of the Atchison, Topeka & Santa Fe with headquarters at Chicago.

Following his graduation from the University of Missouri in 1923, Mr. Barker joined the Illinois Division of Highways as resident engineer and in 1935 joined the office of Highway Planning Surveys with headquarters at Chicago. He was



Frank N. Barker

promoted to director of that office in 1936 and in 1939 was appointed engineer of highway research at Springfield, Ill. He was assigned to the office of the chief highway engineer in 1940 and in 1951 was named chief highway engineer. Mr. Barker will assist the railroad in problems dealing with public works which involve the railroad and various public bodies.

(Please turn to page 900)



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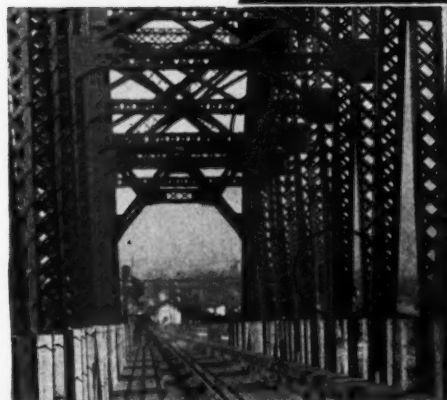
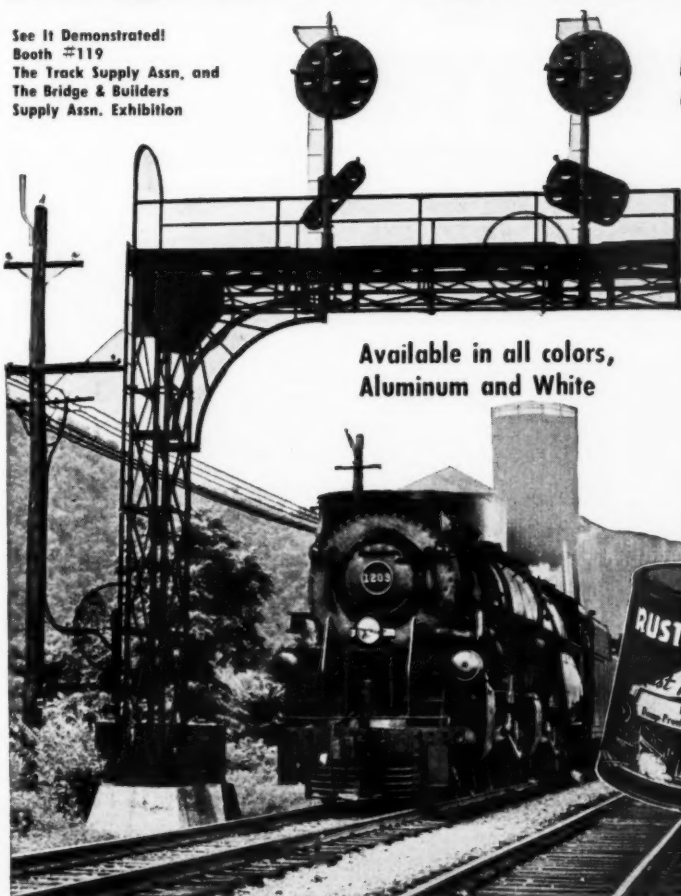
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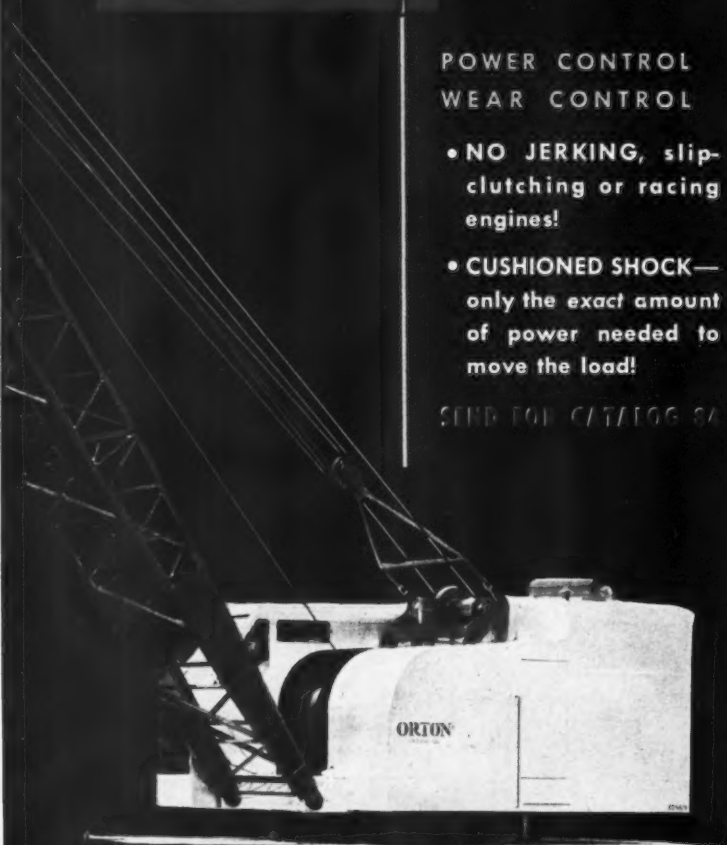
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### Railway Personnel (Cont'd)

**John W. Kidd**, division engineer on the Southern at Louisville, Ky., has been promoted to assistant superintendent at Knoxville, Tenn., to succeed **Robert B. Midkiff**, who, as announced elsewhere in these columns, has been promoted to chief engineer maintenance of way and structures at Knoxville. **John A. Rust**, trainmaster at Greenville, S. C., and formerly division engineer at that location, has been promoted to superintendent of the Charleston division at Charleston, S. C.

### Bridge and Building

**G. W. Gearhart**, assistant supervisor of bridges and buildings on the Shenandoah division of the Norfolk & Western, as announced elsewhere in these columns, has been appointed roadmaster at Wilcoe, W. Va.

**John T. Hiner**, supervisor of bridges and buildings on the Southern at Greenville, S. C., as announced elsewhere in these columns, has been appointed assistant division engineer at Atlanta, Ga.

### Track

**H. W. Lane**, acting roadmaster on the Joliet Division on the Elgin, Joliet & Eastern, has been appointed roadmaster succeeding **H. M. Overpeck**, assigned to other duties.

**C. J. Ellison**, acting roadmaster on South Rocky Mount, N. C., yard work on the Atlantic Coast Line, has been appointed roadmaster at Petersburg, Va., to succeed **R. C. Sharpe**, who has been transferred to Jessup, Ga., to replace **T. C. Ellis**, who has resigned. **B. H. Parker**, senior assistant engineer at Rocky Mount, has been appointed roadmaster at Wilmington, N. C.

**Luke Jones**, whose appointment to supervisor of track on the Pennsylvania at Toledo, Ohio, was recently announced (RT&S, July, p. 682), was born at Curtisville, Ind., on April 11, 1907. Entering the service of the PRR there as a trackman on April 25, 1927, Mr. Jones was appointed track foreman at Eaton, Ohio, in 1942, and general foreman at Anderson, Ind., in 1948. In 1952 he was advanced to assistant supervisor of track at East Liberty, Pa., where he was serving at the time of his recent promotion.

**Ernest K. Ratliff**, assistant supervisor of track on the Southern at Greensboro, N. C., has been promoted to supervisor of track at Batesburg, S. C., to succeed **Marvin E. Wilson, Jr.**, who has been transferred to Salisbury, N. C., to replace **Robert K. Seals**, who, as noted elsewhere in these columns, has been promoted to assistant division engineer at Knoxville, Tenn. **Doyle A. Chambers**, supervisor of track at Greenwood, S. C., has been transferred to Greensboro.

Mr. Ratliff was born at Washington, D. C., on April 27, 1925. He entered the service of the Southern in June 1947 as a

(Continued on page 902)

# PAYLOADER WORKS ANYWHERE

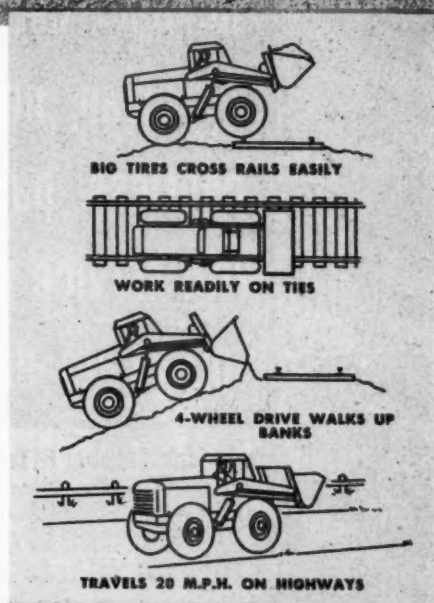


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## Railway Personnel (Cont'd)

section laborer at Manassas, Va., and subsequently served as a rodman at Knoxville, Tenn., and a student apprentice at Manassas. In 1952 he was appointed assistant supervisor of track at Mooresville, N. C., later transferring to Greensboro, at which location he received his recent promotion.

H. E. Simmons, road master on the Norfolk & Western at Sardin, Ohio, has retired after 50 years of service. He has been succeeded by J. F. Anglin, roadmaster at Iaeger, W. Va., who in turn has been succeeded by R. E. Barnett, roadmaster at Wilcoe, W. Va., G. W. Gear-

hart, assistant supervisor of bridges and buildings on the Shenandoah division, has been promoted to roadmaster at Wilcoe to replace Mr. Barnett. V. K. Lowe, roadmaster at Fort Gay, W. Va., has been transferred to Bluefield, W. Va., to succeed J. B. Alley, who has retired after 51 years of service. W. S. Clement, roadmaster at South Boston, Va., has been transferred to Fort Gay to succeed Mr. Lowe, and J. M. Nimmo, assistant roadmaster at Radford, Va., has been promoted to roadmaster at South Boston to replace Mr. Clement. W. D. Kirby, assistant roadmaster at Roanoke, Va., has been promoted to the newly created position of roadmaster on the Radford divi-

sion at Narrows, Va., and R. E. Dangerfield, section man on the Pocahontas division, has been advanced to Mr. Kirby's former position.

Bruno L. Dicasali has been appointed supervisor of track on the Erie at Greenville, Pa., to succeed James K. Weikal, who, as announced elsewhere in these columns, has been promoted to assistant division engineer at Huntingdon, Ind.

## Special

Richard G. May, assistant vice-president of operations and maintenance of the New York Central at New York, has been elected vice-president in charge of the Operations and Maintenance department of the Association of American Railroads succeeding James H. Aydelott, who retired August 31 after 51 years of railroad service.

Mr. May, born August 13, 1904, at Murry, Pa., attended the Indiana Business College and is a civil engineering graduate of the Chicago Technical School.



Richard G. May



James H. Aydelott

Upon joining the NYC, he served in various capacities in the engineering department until 1932 when he was appointed assistant supervisor of track at Cleveland, Ohio. He became trainmaster at Watertown, N. Y., in 1939, trainmaster at Weehawken, N. J., in 1941, assistant superintendent at New York in 1946, and

(Continued on page 904)

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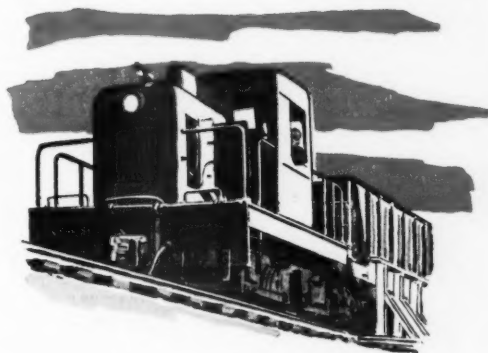
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#### Railway Personnel (Cont'd)

superintendent at Albany, N. Y. in 1948. After being named general manager at Boston in 1949, Mr. May was promoted to manager of freight transportation of the NYC System the following year. He was named assistant vice-president of operations and maintenance in 1952.

Mr. Aydelott, born in Jersey county, Ill., August 13, 1883, obtained his first railroad position in 1902 as a stenographer and clerk on the Burlington at Brookfield, Mo. In 1936 he became general manager of the Burlington, a position he held until March 1947 when he was elected a vice-president of the AAR. During World War II, Mr. Aydelott served with the Office of Defense Transportation as director of its Division of Railway Transport. He has also served in an advisory capacity with other key government agencies, including the Army, the Munitions Board and the National Security Resources Board.

#### Obituary

**Kenneth B. Duncan**, retired chief engineer of the Gulf, Colorado, & Santa Fe at Galveston, Tex., died recently.

**Louis H. Mollnekoph**, assistant engineer on the New York Central at Cincinnati, Ohio, died recently.

**L. L. Coffey**, assistant engineer on the Missouri Pacific at Coffeyville, Kan., died recently at the age of 67.

## Association News

#### Railway Tie Association

The association will hold its 35th annual convention on October 14-16 at the Hotel Biltmore, Atlanta, Ga. The annual presidents' reception will be held from 6:30 to 7:30 during the evening of Wednesday, October 15. The second day will be marked by the association's annual luncheon, to feature an outstanding speaker, and on the afternoon of that day the group will tour the Atlanta plant of the Southern Wood Preserving Company. The annual dinner will be held on Thursday, October 16. The program will include the following addresses:

"Tie Buying Power of Class I Railroads in '54," by Dr. Julius H. Parmelee, vice-president and director, Bureau of Railway Economics, Association of American Railroads, Washington, D. C.

"Will There Be Ample Steel to Make Needed Rails in '54," by Tom Campbell, editor, The Iron Age, New York.

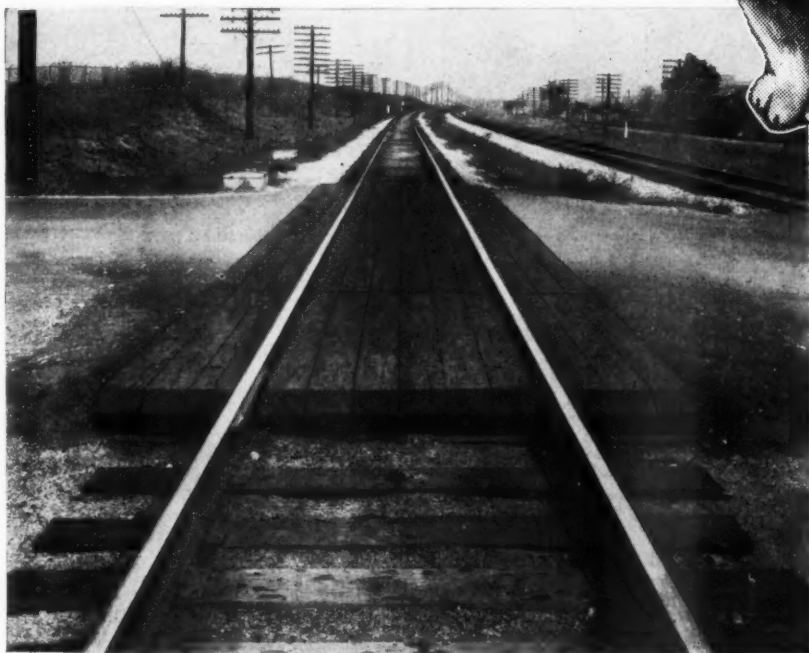
"Looking Back at '53 and Forward to '54 in Crosstie Production," by T. J. Turley, Jr., vice-president, Bond Brothers, Louisville, Ky.

"Outlet for Wood Now Being Wasted in Manufacture of Crossties," by J. A. Hall, director, Forest Products Laboratory, Madison, Wis.

"Three Years' Experience on the Santa Fe in Using Tie Inspectors to determine (Continued on page 906)

# PLENTY TOUGH

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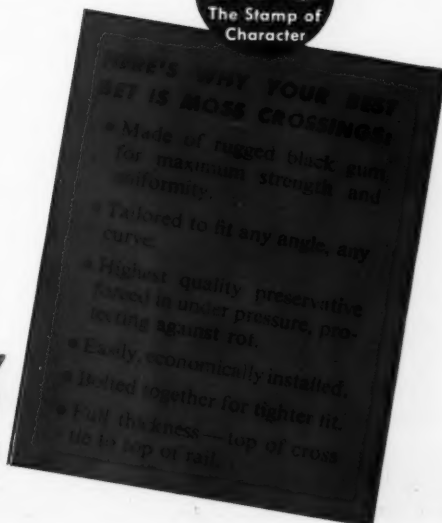
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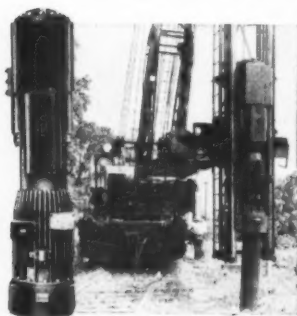


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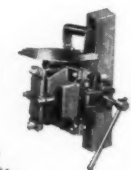
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**Association News (Cont'd)**

the Cause of Failure of Ties at the Time They Are Removed," by T. A. Blair, chief engineer system, Atchison, Topeka & Santa Fe, Chicago.

"Five Years of Crosstie Research and Next Steps," by G. M. Magee, director of engineering research, Association of American Railroads, Chicago.

"Use of Mixed Hardwoods for Cross-ties on the B&O," by C. E. Harveson, chief engineer, Baltimore & Ohio, Baltimore, Md.

"Narrowing Margin Between Tie Cost and Selling Price," by E. W. Jones, treasurer, T. J. Moss Tie Company, St. Louis, Mo.

"Are Measures Now Being Used to Prolong the Life of Crossties Justified from an Economic Standpoint?" by George H. Echols, chief engineer, Southern, Washington, D. C.

**American Railway  
Engineering Association**

A number of committees of the association have scheduled meetings to be held during the month of September. The Committee on Masonry will meet on September 24 and 25 at the Cosmopolitan hotel, Denver, Colo. On September 24, (Continued on page 908)

**Meetings and Conventions**

**American Railway Bridge and Building Association**—Annual meeting, September 15-17, 1953, Conrad Hilton (Stevens) Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

**American Railway Engineering Association**—Annual Meeting, March 16-18, 1954, Chicago. Neal D. Howard, Secretary, 59 E. Van Buren street, Chicago 5.

**American Wood-Preservers' Association**—W. A. Penrose, Secretary-treasurer, 839 Seventeenth street, N. W., Washington 6, D. C.

**Bridge and Building Supply Association**—L. R. Gurley, Secretary, 201 North Wells street, Chicago 6.

**Maintenance of Way Club of Chicago**—E. C. Patterson, Secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

**Metropolitan Maintenance of Way Club**—Secretary, 30 Church street, New York.

**Mississippi Valley Maintenance of Way Club**—P. E. Odom, Secretary-Treasurer, Room 1008, Frisco Building, 906 Olive Street, St. Louis 1, Mo.

**National Railway Appliances Association**—J. B. Templeton, Secretary, 1020 So. Central avenue, Chicago 44; Lewis Thomas, Assistant Secretary, 59 East Van Buren street, Chicago 5.

**Railway Tie Association**—Annual meeting, October 14-16, 1953, Biltmore Hotel, Atlanta, Ga. Roy M. Edmonds, Secretary-treasurer, 1221 Locust Street, St. Louis 3, Mo.

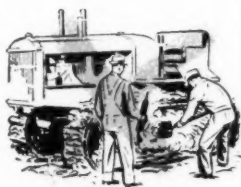
**Roadmasters' and Maintenance of Way Association of America**—Annual meeting, September 15-17, 1953, Conrad Hilton (Stevens) Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn Street, Chicago 5.

**Track Supply Association**—Lewis Thomas, Secretary, 59 E. Van Buren street, Chicago 5.

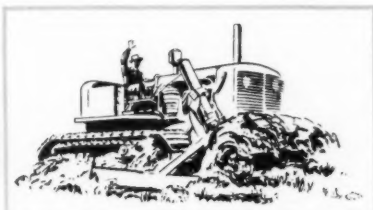
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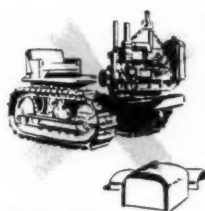
**1000-hour Lubrication.** Operate six months on a 40-hour week basis with just one lubrication of truck wheels, front idlers and support rollers. Positive seals protect from dust, loose sand, soft ground, mud or water. You gain working time, save labor and lubricant costs, eliminate costly damage from greasing neglect.



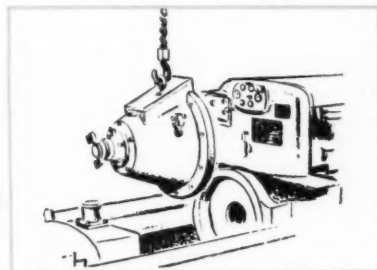
Ordinary Steering Clutches



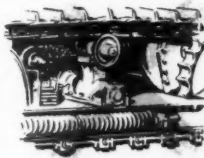
**Hydraulic Steering and Self-Energizing Brakes.** The HD-15 and HD-20 have hydraulic booster steering; operator exerts only 3 to 5 lb. pressure on controls, so he gets small tractor maneuverability from these 27,850 and 41,000 crawlers. Self-energizing brakes need less pedal pressure, take hold with a firm, uniform grip.



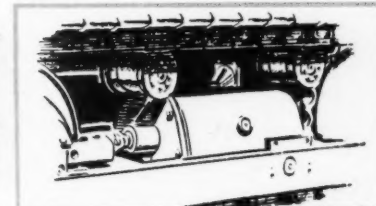
Major Tear-Down



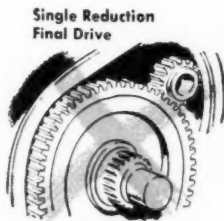
**Unit Servicing.** No need to remove transmission or engine, radiator, grille, etc., when servicing or removing an Allis-Chalmers master clutch. The unit assembly principle also applies to final drive gear, transmission, steering clutches, engine and truck frame. Save hours of costly service and down time.



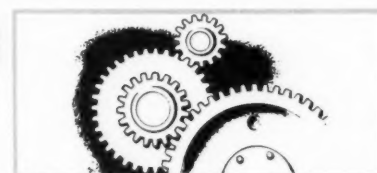
Open or Partly Shielded Track Release Mechanism



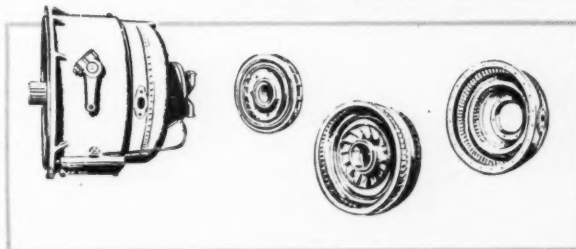
**Oil Enclosed Track Release Mechanism.** Operating in oil and sealed against dirt and moisture, Allis-Chalmers track release mechanism seals out mud, ice and debris. Because it's completely sealed, release mechanism is in working condition at all times — providing positive protection when obstacles jam into the tracks.



Single Reduction Final Drive



**Double Reduction Final Drive.** With smaller gears and shorter shafts, double reduction final drives provide better bearing and gear alignment. The "live" axle permits smaller, more serviceable seals. Equally important, double reduction drive provides for smooth, clean bottom construction and the extra ground clearance so necessary on rough terrain.



**Hydraulic Torque Converter Drive.** The HD-20 is the only crawler tractor where torque converter is standard equipment and part of the basic design. Torque converter gives greater pay load capacity because this unit automatically balances travel speed to the load. And with most shifting eliminated, there's far less operator fatigue.

## ALLIS-CHALMERS

TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

ORIGINATOR OF THE  
TORQUE CONVERTER TRACTOR

## Association News (Cont'd)

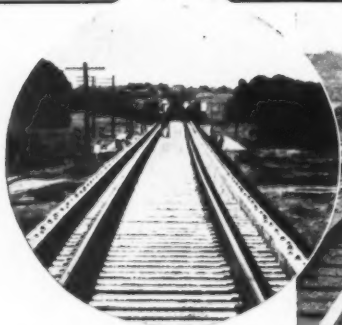
the committee, together with members of the Committee on Impact and Bridge Stresses, will observe the testing of the final reinforced concrete railroad bridge slab of a series of five such slabs being tested for the AAR research staff in the 5,000,000-lb. testing machine of the U. S. Bureau of Reclamation. The Committee on Water, Oil and Sanitation Services will hold a meeting on September 14 in Room 1218 at association headquarters, Chicago. The Committee on Yards and Terminals will meet on September 21 and 22 in the Norfolk (Va.) area with a business session at the Hotel Chamberlain in Old Point Comfort. The meeting will include a dis-

cussion of specialized yards and docks for handling coal, as well as other waterfront facilities in the area. The Committee on Impact and Bridge Stresses will hold a two-day meeting on September 23 and 24 at the Cosmopolitan Hotel, Denver.

In addition, several committees will meet at the Conrad Hilton Hotel, at Chicago, in conjunction with the annual convention of the Roadmasters' and Maintenance of Way Association and the American Railway and Bridge and Building Association, September 14-17. These are the Committees on Roadway and Ballast; Rail; Track; Buildings; Highways; Records and Accounts; Contract Forms; Maintenance-of-Way Work Equipment; Clearances; and Waterproofing.

## Five years later —

### Libbey-ZONE Process Bridge Applications Still in Perfect Condition!



**1948** —The Libbey-ZONE application to this railway trestle has just been applied as a test installation.



**1953** —Five years later. The same trestle, with no interim maintenance recorded for the Libbey-ZONE application. No effect of weathering.

### Reduces Deterioration and Fire Hazard with Remarkably Low Application and Maintenance Cost

Five years is a long time . . . ample time to determine that the Libbey-ZONE Process helps cut bridge fire hazard and reduces tie weathering and deterioration. Going back for a careful examination of the original Libbey-ZONE applications we find they have suffered little or no effect from as much as five years of exposure to all sorts of weather. The original applications are as effective today as the day they were applied. Over the five year period we . . . and the roads that have adopted the Libbey-ZONE Process . . . have learned a great deal about easier, faster methods of application, and this background is now available to those interested in testing this effective fire-preventive and deterioration-resistant process. Recently we have developed remarkable new **ZONE Fireplate** for resisting fires on vertical wood bridge members to protect against prairie and grass fires. We invite your inquiry . . . the facts and proof are yours without obligation.

## THE ZONE COMPANY

Rail Products Division • Box 789 • Fort Worth 1, Texas

## Supply Trade News

### General

To supplement its existing plant and warehouse facilities at Warwick, N. Y., the **Matisa Equipment Corporation**, Chicago, is building a new factory on the northwest side of Chicago to be used primarily for assembling and manufacturing Matisa products. In addition, most of the spare parts for all Matisa products will be manufactured at the new plant to assure better service for Matisa customers.

### Personal

**W. W. Prosser**, of the Railroad Sales department of the **Johns-Manville Sales Corporation** has been transferred to the Special Industry department.

**Irwin F. Woodland**, western district manager for the **Wright Power Saw & Tool Corp.**, Stratford, Conn., has been promoted to sales manager. **Williams S. Evans** has been named assistant sales manager and **William R. Baareck** has been appointed service manager.

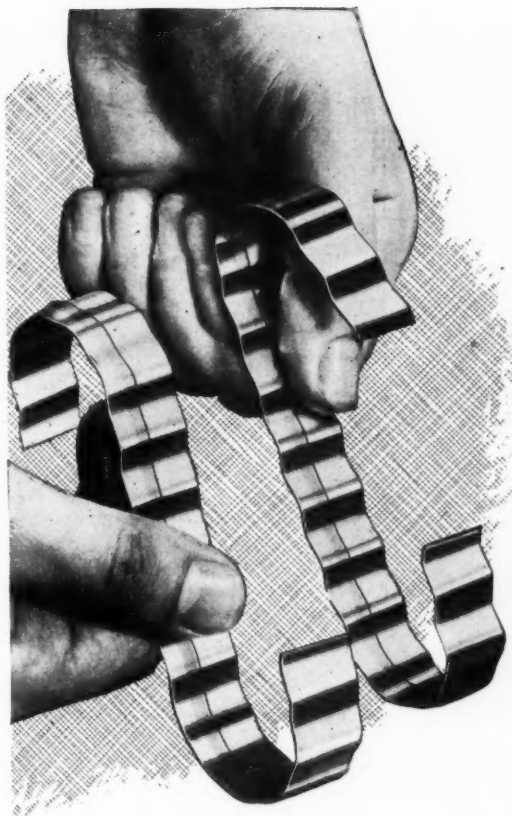
**Douglas Grymes, Jr.**, whose promotion to sales manager of the **Wood Preserving Division of Koppers Company, Inc.**, was recently announced (RT&S, August, p. 766), was born at St. Louis, Mo., and attended Spring Hill College. Upon graduation he joined the **Ayer & Lord Tie Co.**, which later became part of Koppers Wood Preserving division. After sales assignments in Houston, Texarkana, Dallas, and Pittsburgh from 1937 to 1948, Mr. Grymes held the post of Pittsburgh district sales manager for the Division for several years. In his new position he will have responsibility for both railroad and commercial sales of the division.

(Please turn to page 910)



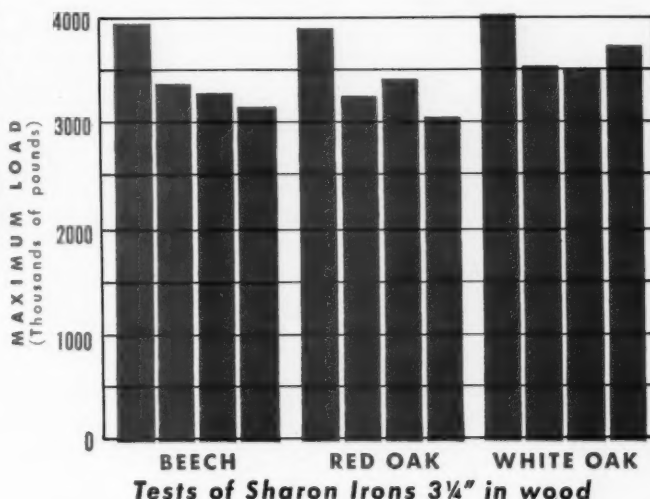
**Fred W. Holstein**, general manager of sales and engineering for the **Rails Company**, who has been elected vice-president with headquarters, as before, at Hoboken, N. J.





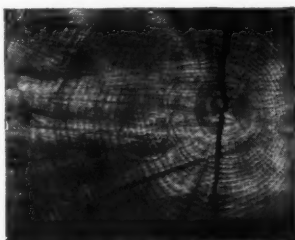
## New tests prove SUPERIOR HOLDING POWER of SHARON IRONS

Test data approved for release by  
PITTSBURGH TESTING LABORATORY



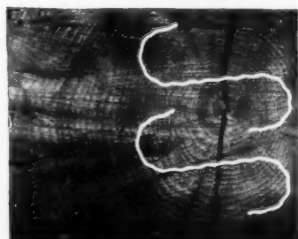
### Why you can depend on full holding power of Sharon irons

Here is a typical checked tie. Note off-center position of the split. If an alternate holding device were centered in this timber, it would have an effective depth from the split of only 1 1/2 inches; and effective holding power would be only 1800 pounds\*.



\*Holding power of alternate device at various depths:

1/2"	390 pounds
1"	1030 pounds
1 1/2"	1800 pounds
2"	2550 pounds
2 1/2"	2920 pounds
3"	3090 pounds
3 1/2"	3575 pounds



If Sharon irons had been installed in this tie, they would have been driven at the heart of the timber, thus would have exerted maximum holding power to prevent splitting. (Based on test data, holding power approximately 3541 pounds.)

TESTS, proving the high holding power of Sharon anti-checking irons, were made by driving various types of 5" Sharon irons into test timbers, approximately 3-1/4" deep. The exposed end of each iron was then gripped by a testing machine and pulled until the wood began to plug and finally until maximum loading was reached. The average maximum load carried by Sharon irons, of C and S types, crinkled and plain, in different types of wood, was 3541 pounds.

You can obtain this superior holding power of Sharon irons and provide insurance against splitting of ties at surprisingly low cost. Railroad figures show installed cost of Sharon irons is about seven cents per main line tie . . . approximately 1/4 the cost of alternate methods.

**Call Brainard now for complete information**



For booklet and/or samples,  
write Brainard Steel Division, Dept. HH-9,  
Griswold Street, Warren, Ohio.

**WARREN, OHIO**



This Aladdin Grease Lubricator  
costs only **\$178<sup>00</sup>**  
delivered

*Where do you need grease lubricators  
but haven't installed them because of cost?  
Here is a well-proved answer to your problem!*

For example, one road found 29 spots to use the Aladdin in a single terminal yard. Others are using them on short curves and other in-between points of wear. And still others are using them on main lines where diesels are causing unexpected wear.

**How it works:** It's hard to believe that such a simple device performs so efficiently. The Aladdin is a self-contained valveless pump. There are *no* external parts. It works by reason of inertia and vibration forces developed by wave motion of the rail. A passing wheel shakes the lubricator and feeds it grease—as simple as that! It will work at any speed from 5 mph upwards. Grease flow is adjustable, and "carry" is  $\frac{3}{4}$  of a mile or more.

**No Maintenance:** The *only* moving part in the Aladdin is a spring-loaded piston which moves at the rate of only 7 inches a week! If the Aladdin goes dry accidentally, no harm is done, because *no part of the lubricator is touched by passing wheels*. Thus there is no maintenance at all—except to fill it!

**Easy to Install:** One man can handle and install the Aladdin in less than half an hour. Two wrenches are the only tools needed—and they are supplied free with each unit. Just scoop out a little ballast...clamp the lubricator to the rail base (no drilling necessary)...adjust, then fill it with *standard graphite grease*—that's all! It can be moved or removed just as quickly.

**Proved:** Thousands of Aladdins are in use all over the world on main lines...in yards...under one or two-way traffic...in climates from 120 in the shade to 20 below. For further information, write for Bulletin C.

**H. T. KENNEDY COMPANY, INC.**  
37 Wall Street New York 5, N. Y.

## Supply Trade News (Cont'd)

Walter A. Enstrom has been promoted to manager of the Railroad Track Materials division at the Chicago plant of the Pettibone Mulliken Corporation.

Robert A. Baer, a graduate engineer, has been appointed vice-president of the Matisa Equipment Corporation, Chicago. After having represented Matisa since 1946 in many countries throughout the world, Mr. Baer joined the Chicago office of Matisa in 1949 soon after it was established, handling sales, service, and allied duties until his recent appointment as vice-president.

## Obituary

Stephen E. Shoup, vice-president of the Association of Railway Track Contractors of America, died recently.

William B. Rudd, senior engineer—classification yards for the Union Switch & Signal Division of the Westinghouse Air Brake Company, died recently.

## Trade Publications

(To obtain copies of any of the publications mentioned in these columns, use postcards, page 885).

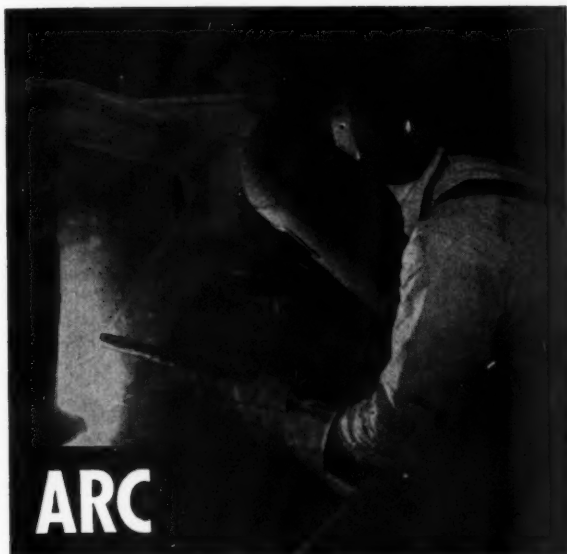
**Scrapers**—A new three-color, 12-page illustrated catalog has recently been issued by the Tractor Division of the Allis-Chalmers Manufacturing Company, covering the complete line of seven pull-type scrapers presently available through Allis-Chalmers dealers. Detail views of each of the four units produced at the firm's Cedar Rapids (Iowa) works are shown, together with those of three Gar Wood scrapers. The catalog also includes complete specifications and other pertinent data on each of the seven units.

**Towers, Ladders**—The J. H. Holan Corporation has recently issued two pieces of literature dealing with their hydraulic aerial ladders and series of heavy-duty hydraulic towers designed for utility truck mounting. The former bulletin describes the Holan Series 2100 aerial ladders and presents a summary of the features of the devices together with illustrations and drawings which illustrate its operation.

The other bulletin, a four-page, two-color presentation, presents full details and specifications of the Holan series HT heavy-duty hydraulic towers which can be equipped with stationary, rotary or transverse platforms. Models 1330, 1320, and 1315 are described. Photographs and specifications are included of each model.

**Dump Cars**—The Baldwin-Lima-Hamilton Corporation has recently released a publication, designated as bulletin No. 5000, illustrating the mechanical design of Western air-operated railroad dump cars. The 4-page, 2-color booklet contains specifications for both 30 and 50 cu. yd. units, and presents illustrations that portray the special features of the cars.

(Please turn to page 912)



**AIRCO HELMETS:** A complete line of helmets and face shields in a wide variety of styles and types. In any kind of service, these Airco products provide the greatest possible operator safety and comfort.



**AIRCO HOLDERS:** Famous Jackson jaw-type and Martin Wells screw-type holders. Nineteen Jackson models, from 200 to 500 amperes. Six Martin Wells, including the Heavy Duty Model 6S — the only holder on the market that will handle 700 amperes!



**AIRCO GLOVES:** The same quality that makes other Airco accessories the best value you can buy extends to welders' gloves and leather sleeves.



**AIRCO CABLE AND CONNECTIONS:** Unrivalled dependability, long life and flexibility. Sizes from 4 to 4/0, for wide range of amperages at varying distances from welding machine. Make sure of good connections with Airco ground clamps, cable splicers, Quik-Trik cable connectors and cable lugs.

## RELY on AIRCO quality in both fields



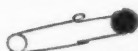
... And soapstones, tip cleaners, clamps, circle cutting attachments, carrying cases, carbon pencils, carbon torches, graphite electrodes, chipping hammers, brushes . . . you name it — Airco has it at low prices. Call or write for your copy of Catalog 13, "Airco Welding Accessories," and complete price list.



**AIRCO GOGGLES:** for gas welding or cutting. Precision made, they afford excellent ventilation with maximum eye protection. All types exceed National Bureau of Standards requirements.



**AIRCO CYLINDER TRUCKS:** Make your welding and cutting outfit easily portable with an Airco two-wheel hand truck. Strong, rigid, welded steel frame; broad steel platform. Five models offer wheel sizes and styles for every type of surface.



**AIRCO SPARKLIGHTERS:** Save time and trouble with the standard Airco sparklighter and its replaceable round file, or the heavy-duty Airco Tri-Flint model, which carries three flints in a rotating holder.



**AIRCO TWIN-HOSE:** Two lines of hose moulded into a single, light, flexible unit. Close, tight braid permits thicker rubber cover for greater wear resistance.



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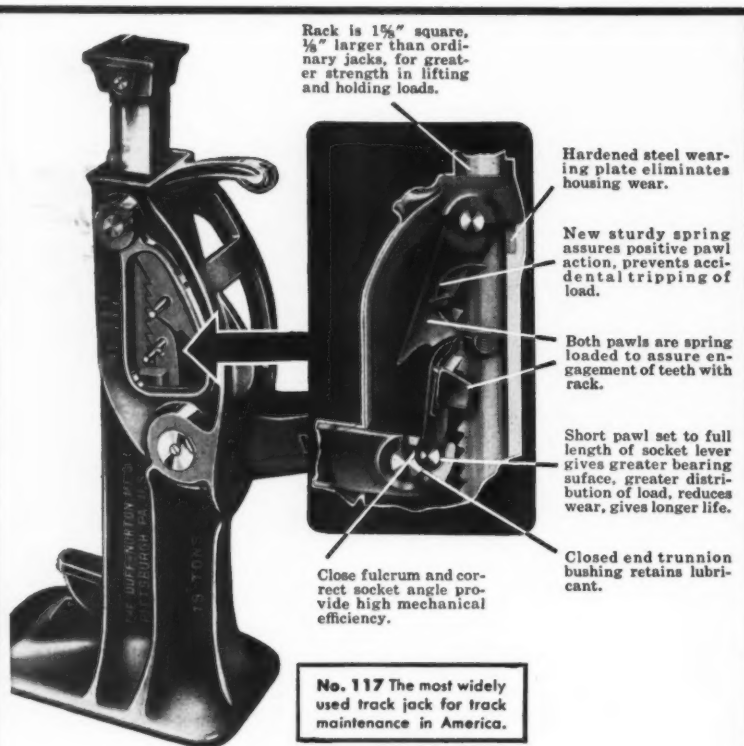
Air Reduction Sales Co. • Air Reduction Magnolia Co. • Air Reduction Pacific Co.  
Represented Internationally by Airco Company International

Divisions of Air Reduction Company, Incorporated

at the frontiers of progress you'll find







## It's taken exactly 70 years to build this jack . . .

. . . and we haven't finished yet and probably never will because we are never satisfied.

Someone comes along with a suggestion for a longer lasting bushing or a stronger spring or a better grade of steel in this or that part and if it helps give you better service, it's adopted.

Read the features (above) that make the No. 117 a favorite with railroad men throughout the world. For complete information on this and other Duff-Norton Jacks made exclusively for railroad men, write for bulletin AD18-F, The Duff-Norton Manufacturing Company, P.O. Box 1889, Pittsburgh 30, Pa. Canadian plant—Toronto 6, Ontario.

# DUFF-NORTON

# Jacks

see you at the  
**Railroad Show**  
Booth 50  
Chicago Coliseum • Sept. 14-17

"Giving Industry a Lift Since 1883"

### Trade Publications (Cont'd)

**Welding**—Detailed information on "Heliarc" inert-gas shielded-arc welding, surfacing, and hard-facing of hard-to-weld metals and alloys is contained in a new 28-page illustrated booklet presently being offered by the Oxweld Railroad Service Company, division of the Union Carbide & Carbon Corp. Entitled, "How to Weld with Heliarc Torches," the booklet describes the manual techniques of the welding operation with the aid of photographs and drawings. Data for all welding conditions are listed in easy-to-read tables.

**Paving Breakers**—A new catalog, recently issued by the Ingersoll-Rand Company, presents the complete specifications of the firm's series of paving breakers. The booklet contains typical cross-section views showing the important features of construction and design of I-R breakers, help to emphasize the "Right Breaker for Every Job" theme of the catalog. In addition, two pages of the eight-page bulletin illustrate the individual tools and accessories available for the complete line.

**Gasoline Engines**—The Wisconsin Motor Corporation has just released a complete catalog of its line of air-cooled gasoline engines. The attractive 3-color, 68-page book is profusely illustrated with photographs showing Wisconsin engines applied to a wide variety of jobs from sandblasting to spike pulling. Complete specifications, power curves and dimensional illustrations are included for all models. A complete listing of the firm's world-wide distributors is presented along with a picture index covering the Wisconsin engines used in the agriculture, construction, industrial, material handling, oil and railroad fields, as well as in specialized service, and pictured in the catalog.

**Powder-Actuated Fasteners**—The Ramset division of Olin Industries, Inc., has recently published a complete applications manual for use with its powder-actuated fastening system. The manual has been compiled from field reports and includes photographs and cut-away sketches which show how powder-actuated tools and fasteners are best employed in the building, construction, and maintenance fields as well as in many other fields. The manual lists the specifications of more than 20 Ramset fixtures and accessories and 56 drive pins and threaded stud fasteners. Selection tables setting forth the proper type of fastener and the proper powder charge for various receiving materials are included as a guide.

**Welded Rail**—"Rails of Tomorrow," a new motion picture on continuous rail, is now available from the Oxweld Railroad Service Company, a Division of Union Carbide and Carbon Corporation. The 14-min. color-sound film, made by the Spokane, Portland & Seattle, shows the various steps of "Ribbonrail" welding service and the welding and laying of 6 miles of continuous rail. Also shown is the unusual transportation method devised by the railroad to move 1,500-ft. lengths of pressure-welded rail.

(Please turn to page 914)

# You too, can reduce track maintenance costs with **RACINE** **PORTABLE** **TRACK** **TOOLS**

*Features that make it easy for you  
to choose a RACINE portable Rail Saw*

▶ **LABOR SAVING** — One man operation, does the work of several hands. Easily moved by two men — no traffic interference.

▶ **EFFICIENT** — In or out of track, a Racine Saw cuts fast, smooth and accurate. Cut-off any length down to one-tenth of an inch.

▶ **MATERIAL SAVINGS** — Shattered and burned rail ends, failures from fractures caused by "nick and break" or torch methods of cropping are substantially reduced.



WRITE FOR NEW CATALOG showing  
Racine's complete line of Rail Tools. Address  
**RACINE HYDRAULICS & MACHINERY, INC., 2038 Albert St., Racine, Wis.**

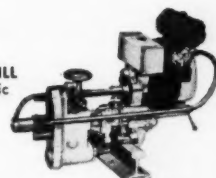
## RACINE

HYDRAULICS & MACHINERY, INC.



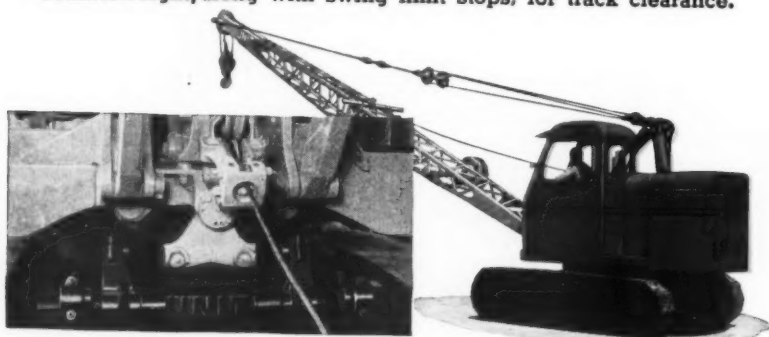
**RACINE UNIT TIE TAMPER**  
Lightweight — Shock-Free  
Operation

**RACINE PORTABLE RAIL DRILL**  
Lightweight — Automatic  
Power Feed





Many of the features found in the UNIT 1020R were built around the ideas and suggestions of railroad engineering specialists. Its modern design assures fast, easy control, both in crane and excavator operation . . . on the line, or off-the-track. A low overall height allows for underpass clearance. Narrow gauge crawlers permit unloading in, and moving through, gondolas. A tapered counterweight, along with swing limit stops, for track clearance.



Swing-Limit Stops act as automatic guides where space does not permit a full swing. Eight cushioned stops offer a selection of working ranges within safe operating limits. Prevents fouling the adjoining track, or striking obstacles when working in confined quarters.

With a reputation for high production and economical operation, the UNIT 1020R is a machine you'll want to know more about . . . Write for complete details regarding specifications and working ranges.

UNIT CRANE & SHOVEL CORP. 6403 W. Burnham St., Milwaukee 14, Wis., U.S.A.



## Trade Publications (Cont'd)

**Crane Improvements**—A complete description of the Orton one-man Aero Crane, recently equipped with the GM Allison Torque Converter, is contained in a new 16-page bulletin recently published by the Orton Crane & Shovel Co. The booklet, which contains a complete description of the crane, presents a separate treatment of the "Torque-Control" unit, specifications and capacities.

**Drafting Machines**—The Charles Bruning Company has recently issued a new drafting machine booklet which presents a complete mechanical description of the various drafting machine models including gravity compensated, track type, civil engineering and detail machines. Entitled "The Finest in Drafting Machines," the well illustrated, 2-color, 20-page booklet also pictures and describes the latest types of scales for all uses.

## NEW BOOKS

*Railroad Engineering, Vol. 1*, by William W. Hay, associate professor of railway civil engineering, University of Illinois; 483 pages; published by John Wiley & Son, Inc.; New York. Price \$7.50.

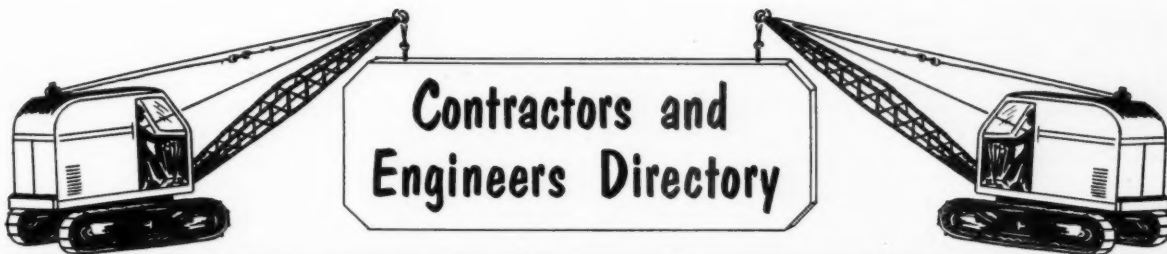
In this, the first of two volumes on the subject, Professor Hay brings together, in compact form, a review of modern railroad engineering problems, methods and practices. The first new book on the subject in 30 years, it is a complete treatise on railroad location, construction and maintenance. Although developed primarily as a textbook, the work is invaluable as a reference for all railway engineers. While presenting underlying basic theory wherever possible, the book also presents the general details of overall railroad operation—the problems encountered therein and their relationship with the engineer. Such material is presented in the first part of the book.

The second part deals with principles of maintenance and construction with especial emphasis upon the former—comprising as it does today, such an important part of railway engineering. The author has drawn freely from his store of railroad knowledge, derived in part from his active participation in the activities of the A. R. E. A. and the Roadmasters' Association, to present up-to-date facts of especial value to young engineers. Economy is stressed throughout and the latest available cost figures are presented in text, tables and charts to aid the reader.

The author has been eminently successful in presenting to the railroad engineering profession a long-needed addition to technical railroad literature. It will no doubt gain widespread use to the mutual benefit of engineers, the colleges and the railroads.

The second volume, presently in the stages of preparation, will deal with physical railroad properties—yards, terminals, etc., and will be reviewed in these columns upon publication.





## TRESTLES - BRIDGES - TRACKS

BUILT AND REPAIRED

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No job too large or too small!

### Serving:

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### "Sorry I missed you at the conventions..."

Try as you might, you know you won't be able to contact *all* those key railroad men on your list at the coming conventions. Pressure of business, previous engagements, etc., often tie up every minute of their time. And you won't have time to really talk to those you do see. Want to make sure you get your message across? Here's the answer:



The October issue of *Railway Track and Structures* will again be our special Roadmasters' and Bridge & Building convention issue. Complete editorial treatment will be given to all the details of the conventions and directed alike to those railroad men who couldn't make it to Chicago as well as those who were there and want to review the important accomplishments of the two associations. Result: **READERSHIP**. Increased readership to provide you with an excellent opportunity to get your sales message across. Forms close September 15. Act now!

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**HYDRAULIC**



**SAVES TIME MANPOWER EXPENSE**

Here's the answer wherever economy in light earth-moving operations is essential! The new High Lift Hydraulic "Agricat" gives low-cost, low-maintenance loading... plus superior performance in those cramped, hard-to-get-at-places. Its five cubic foot capacity permits loading a 2-yard dump truck in ten minutes. Steel welded construction, with high carbon cutter bar and ripper teeth, means years of trouble free service. See the new High Lift Hydraulic "Agricat" now! Sales job demonstrations are available by appointment.

## EARL H. PENCE & CO., INC.

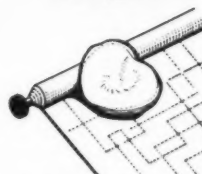
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## KRAFTBILT *Lifetime* MAP CABINETS

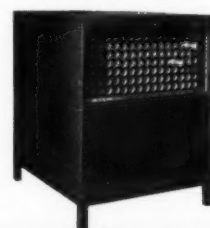


*hold more  
take less space*

One Kraftbilt Vertical Rollfile holds 96 rolled maps. One unit of a Kraftbilt Horizontal Rollfile holds 112 rolled maps! Made specially for all types of rolled charts and plans, tracings, blue prints, maps, drawings. Of all-steel, fire-resistant construction. Disappearing doors and drawers mounted on ball-bearings. Kraftbilt cabinets lock out dust, moisture, insects. Send for Bulletin 352-B for details.



Kraftbilt all-plastic snap-on Map Sticks take the work out of map handling. They are quicker, lighter, stronger. And Kraftbilt Map Weights act as extra hands in eliminating the use of thumb tacks. Just toss 'em on!

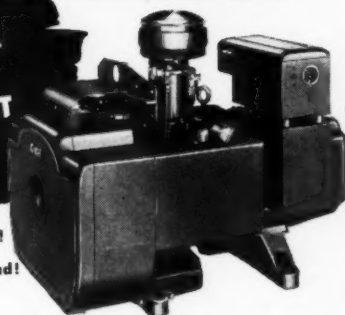


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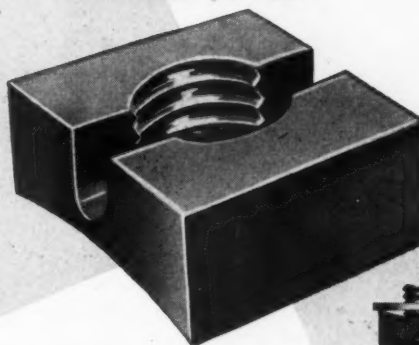
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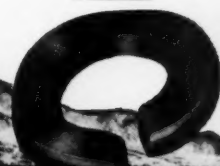
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